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THE SCIENCE OF EATING

ALFRED W. McCANN

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HOW TO INSURE STAMINA, ENDURANCE, VIGOR, STRENGTH AND HEALTH IN INFANCY, YOUTH AND AGE

BY

ALFRED W. McCANN

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PREFACE

The author has acquired his knowledge of food conditions in America through years of service "on the inside," behind the screens. For five years during the period of Dr. Harvey W. Wiley's service as chief of the Bureau of Chemistry, Mr. McCann's activities were largely confined to a laboratory under the roof of a modern food factory. His constant daily associates were federal, state and municipal food inspectors, chemists connected with federal and state departments of agriculture, food manufacturers, importers, jobbers and commission men.

As the advertising manager of a food business, handling prepared foodstuffs to the extent of $12,000,000 a year, he learned that no food reform can come through advertising as now conducted. "The advertising manager," he declares, "cannot state the whole truth in a food advertising campaign for the reason that the manufacturers insist that their advertisements shall center about the talking points that will sell their products, always keeping clear of controversy. The chief function of the advertising manager is not to educate the masses but to popularize the product he is paid to exploit."

Following his graduation from the food industry, Mr. McCann received the support of a New York newspaper, *The Globe,* which equipped him with a laboratory and set him free to report the results of his discoveries without regard to their influence upon the Advertising Department.

Subsequently forty-one other newspapers in as many cities of the United States took up his work, but so heavy was the pressure applied by advertising agencies that the publishers of all these papers, with one exception, the *Chicago Daily News,* found themselves compelled to discontinue his exposures. In this respect the photographs of original documents showing how truth is suppressed in daily journals, weekly periodicals and monthly magazines are in Mr. McCann's possession, a fitting justification in these days of "regeneration" and "reconstruction"

for a Congressional inquiry into the nature of the silent influences at work to muzzle the press.

During Mr. McCann's service on the New York *Globe* he has been made a deputy health commissioner by five municipalities, has been employed by as many mayors and police commissioners to make surveys of the food conditions obtaining in the communities represented by them. He has led squads of plain clothes men and trained field agents, including attorneys and physicians, upon raids that have resulted in scores of indictments, trials and convictions in municipal, state and federal district courts.

He has been used as a witness by the U. S. Department of Justice in interstate conspiracy prosecutions; by the Attorney General of New York State; by the District Attorney of New York County; by the Corporation Counsel of New York City; and by other public prosecutors.

He has been arrested on charges of criminal assault and upon trial in a hostile court has been acquitted. On numerous occasions he has been tried on charges of criminal libel from which he has always emerged the victor. He has been held for grand juries on charges of criminal conspiracy but the cases against him, when submitted to the grand jurors, have always been dismissed. He has initiated two hundred and six successful prosecutions of food adulterators and has never lost a case.

As a result of his vast experience he no longer looks to commercial publicity or to legislation as a means through which to bring about food reform in America. Most of the conditions described in this work are now known to the various state legislative bodies but all efforts to influence the enactment of adequate laws covering the abuses described have thus far been defeated. In Mr. McCann's opinion, it will be a long time before Congress will successfully grapple with the facts which he now outlines in detail. It is his belief that the work must be done in the schools, that our American children must be taught the meaning of depraved foods, that they must learn how foods are processed, bleached, colored, sifted, bolted, denatured, degerminated, demineralized, chemically treated and refined; that they must be taught the relationship of foodless food to sickness and death; that they must be taught the relationship of natural food to health and life.

In this revised and enlarged edition, the author has incorporated a schedule of ideal food combinations for children over the age of three years. These suggestions may be used as meals for the entire family with such additions or deductions as season or inclination may decide.

He holds that the true conditions now so completely hidden from the public view and so rarely referred to in the public press must be exposed in order that the public, guided by the dictates of common sense and an adequate realization of economic facts concerning the food supply of America, may successfully wage war against abuses which threaten the very foundations of national health and prosperity.

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ONE: THE HUMAN SCRAP HEAP IS PILING HIGHER

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§ 1—GOD HAS PRESCRIBED

Is there any evidence that will stand the scrutiny of modern judge and jury, to indicate that God has prescribed a formula for the nourishment of the human family?

There is. We shall see it in all its wonder.

Does this formula endow human nature with disease-resisting vitality?

Does it fortify the prospective mother against the ravages so often suffered by her?

Does it protect the infant and control the development of the child?

Does it usher the adult uneventfully into the shadows of age?

Does it stand on guard to protect men of good-will, their wives and children, against the assaults of those malign forces which seemingly, as if man were completely abandoned to the malicious whims of a superior but malevolent power, attack him from all sides?

The imperious answer is "Yes." The Twentieth Century laboratory, which has nothing to do with the spiritual nature of man, is witness to the truth.

When man's house is built its wonderfully organised inmate is constantly wearing and wasting away. Repair is necessary; incessant, never-ending repair.

The repair materials are at hand. They are found nowhere but in food, in food alone.

No officer tolerates an unfit soldier. No business man tolerates an inefficient employé. No musician tolerates a jarring note. No physician tolerates incompatibles in his prescriptions, but in twenty-million homes in the United States to-day there is complacent toleration for food abuses that sap the stamina of the race.

These abuses, despite what is now known of them as a result of government research, parade the signatures of learned authorities, who sell their testimony for a fee, so that, as if by necromancy, the uninitiated may accept eminent names in lieu of missing elements in manipulated foods. Upon those missing elements life itself depends.

To expose this disorder in all its deadly significance, specialized effort has been made for years, but until 1912 little progress was recorded.

Public utterances from the platform and through the press, including at one time, 1916-1917, as many as forty-one newspapers scattered throughout the largest cities of the country, were greeted in high places with lofty sarcasm, and swept aside by the authorities as unworthy of consideration.

Finally with the aid of a great metropolitan journal came a long period of dragging the truth into the courts.

During the years dating from January, 1913, to the middle of 1918, in Municipal, State and Federal District Courts, that journal, the New York *Globe,* was responsible for the conviction of three hundred food sophisticators who, prior to their prosecution, had been able to hide behind the screens erected by the authorities, all of whom denied that its "unsupported" charges were true.

The court records of these cases, without an exception, have withstood the scrutiny of judge and jury and the fruits of that long and costly struggle are now passed to the people.

We know to-day, apart from the mere frauds that tax the pocketbook but do not affect human health, that a hundred food evils of grave significance constitute many of the building materials upon which young America, as well as stricken Europe, depends for growth and sustenance, under the eyes of man-made law that does not interfere.

Every pound of these food frauds is a pound of excess baggage borne by the growing child, the expectant mother and the invalid.

Every pound of food juggled, changed, denatured or chemically treated is balanced by a pound of human flesh.

Every pound of such food defies nature's standards, so marvellously formulated that each of them bears upon it the mark of divine origin. Advancing this assertion I shall prove that it is

not tainted by mysticism or fervor; that it stands untrembling under the coldest light of pagan science; that our own government has helped to focus that light upon it.

Commercial wizardry attempting the impossible task of supplying the human family with food that will not support the life of animals, strives to maintain the dignity of its effort. Although thus far successful in its purposes it cannot longer ignore the truth, for from every laboratory in Europe and America are handed down to meet it indictments of such gravity that they can neither be disguised nor concealed.

Wondrous are the operations of Mother Nature, but she will suffer no wilful abuse. Her laws were established by a Higher Power, and man who feebly attempts to imitate them in his construction of a flying machine or in the development of his herds, turns his back upon that miracle of life, a growing child, and disdains to believe, or pretends to doubt, that the child is also subject to law.

§ 2—FOOD FOR HEALTH OR DISEASE?

Live stock and crops are fed according to fixed laws. Infants and children, men and women, are fed in ignorance and caprice.

Our daily food, less understood after years of agitation than the referendum or the fourth dimension, is so masked in mystery that scarcely one in ten thousand can give a definition of the phrase.

To the housewife and those dependent upon her judgment for health and life nothing is more vital, yet few are the homes in which the simple laws of nutrition are applied. The people no longer know the origin of their food or how it is prepared. They have lost control.

Babies are born every day, and every day children are fitted for school. Though food is their first and most important necessity, its knowledge is chiefly confined to owners of stock farms, producers of prize sheep, horses, poultry, hogs and blue ribbon cows.

Intelligent herdsmen apply their knowledge of its meaning and

measure results according to fixed operations when not deceived by the feed manufactures. They know the growth, development and vigour of their animals depend upon the operation of clearly defined and inviolable laws.

They make a business of feeding for certain desired ends. To them pure food is not a mystery. It is the means whereby they supply proper building materials to the physical needs of the creatures in which their money is invested; the instrument with which they prevent disorder and sickness among their herds, flocks, kennels and litters.

The average farmer, as far as his soil is concerned, instinctively recognizes the meaning of pure food. He knows if he does not supply his vegetables and grains with the right kind of soil food he will reap a stunted and a feeble crop, or suffer a crop failure.

The United States Government has developed around this truth one of its costliest departments, the chief of which, in the person of the Secretary of Agriculture, is a member of the President's cabinet.

That live stock and crops should receive the benefit of man's interest in pure food, while thus far in the affairs of our national development infants and children do not, is symbolic of the soul-sickness of the world.

Woman's interest in pure food has not yet crystallised, though she has love instead of commercial expediency to inspire her. Is love less potent than profit?

Thousands of untimely deaths, the true causes of which are rarely suspected, are occasioned by pitiable ignorance of the simplest of God's laws, yet upon its serene though neglected splendor beams the infinite love of the Creator.

The *Journal of the American Medical Association* declared, July 20, 1918, that when the announcement was made by the Bureau of Child Hygiene of New York City that between 12 and 15 per cent. of its school children are underfed, it was received with scepticism by some and with surprise by others. The world refuses to believe.

F. A. Manny of the New York Association for Improving the Condition of the Poor declares, as a result of systematic studies made in New York City, that at least one-third of the school

children are so much below the standard of growth as to call for special nutritional care. The world disregards the fact.

There are now in the public and parochial schools of Greater New York more than 2,000,000 children. Of other children under six years of age and between the ages of six and sixteen not in school, either at home or at work, there are nearly 2,000,000 more.

New York City alone boasts of nearly 500,000 children in need of nutritional attention, but the problem is not a New York problem or a Chicago problem or a San Francisco problem; it is not even an American problem.

Back in 1910 the chief medical officer of the English Board of Education declared as a result of data collected by him that defective nutrition stands in the foreground as the most important of all physical defects from which school children suffer.

In 1906 Dr. W. R. P. Emerson collected into a class a number of the weakest and most poorly nourished children from several thousands of patients in the Boston Dispensary. These children were "fed up." Their response was magic.

Dr. C. H. Smith duplicated this experiment in connection with Bellevue Hospital, New York City, reporting it possible to make 57 per cent. of the under-nourished children gain nearly twice the average rate for their ages, and 22 per cent. gain at about the average rate, a total of 79 per cent. gaining at or better than the average rate.

These results, obtained under most adverse circumstances, are ignored where no problems make their application difficult.

Lack of food is not responsible for the tragedy. Rejection of the right kind of food is behind it.

Ignorance in the home is not the only highway to physical infirmity and death. The widest road, never marked with a sign post, is the road that leads through commercial greed to the little white casket.

We propose to take this road at whose every turn the laws of God are deliberately broken, so that we may learn just how, although so sacred when applied to animal life, they are outraged and debauched in the food factory.

Where the fault originates in the caprice of the housewife herself, through thoughtlessness of her own or inheritance from grandmother's superstitions, the picturesque, wonderfully inter-

esting, though tragic results of such household sins, when applied to the diet of white mice, rabbits, guinea pigs, monkeys, chickens and cows will be disclosed.

Where the abuse is purely commercial the mask will be torn off, and in such instances as are borne in lust for gain at the expense of human life, the natural, obvious, practical reform will be pointed out.

For the old abuses, for which politics, clever lawyers and commercial scientists have succeeded in erecting a flimsy protection in the defence of unnatural and Godless practices, there will be no mercy.

The physician who follows these pages will come into possession of facts not to be obtained in the medical schools of Europe or America. He will receive new information with regard to many of the causes of malnutrition, anemia, neurasthenia, edema, Bright's disease, diabetes, cancer, hardening of the arteries, tuberculosis and other preventable diseases which, in the form of needless pain, are so frequently visited upon the bodies of the ignorant and unwary.

Whispering through the Twentieth Century laboratory the voice of God can be heard. It requires no strained ear to catch its echoes as they come up centuries old from Genesis, Leviticus, and Deuteronomy in waves that roll from enamelled wall to enamelled wall, protesting in the name of the cradle, the nursery, the kindergarten, the school, the home and workshop against the special privileges and follies that to-day as never before must render their long overdue account to a grim jury of awakened mother love. Faith in the all-wise but unheeded provisions of the Creator is the instant need.

§ 3—THE WORLD FACES A REBIRTH

The reconstruction following the war, in which for many years not only the allies but also America will have to deal with the hardest of hard conditions, has already begun its clamour for the corporal as well as the spiritual reclamation of man.

The tearing down of the world is actually less visible in the

devastated regions where cities, towns, villages and country sides are now but scorched and broken patches than in the physical ravages which all mankind dumbly suffered throughout the war, and which for many years prior to the war had been eating into the health of the white race of all lands. Are we civilised? Far from it!

In May, 1918, in New York City alone, Dr. S. Josephine Baker reported 216,000 children suffering from malnutrition, with all that malnutrition involves, as a direct result of the war, although America had been in the war scarcely a year. The war has taught us that our children do indeed constitute our second line of defence, just as the Boer war opened the eyes of Great Britain to the infirmities of its second line of defence.

During the Boer war so many men applying for service were rejected because of physical defects which could have been avoided or overcome that the whole British Empire, shocked into a realisation of its neglect of the child, turned its belated attention to the deficiencies thus so appallingly revealed.

In America's first draft 500,000 of our "best" young men in the very flower of their manhood were rejected as physically unfit for service.

After the long struggle our nation, for many years, will be engaged in tabulating two kinds of men, those that helped and those that did not; the fit and the unfit; the accepted and the rejected.

The finest types of physical manhood entered the service, the others were left at home, to father their kind.

In this single fact humanity faces a reaction against which, if it would tune up the vigor and stamina of infants yet unborn, must be thrown all its conscience, intelligence and energy.

We can no longer ignore our children as they have been ignored, otherwise our inspiring accomplishments in organising all the resources of America will degenerate into a mere expediency, leaving behind a long trail of calamity and misery. By looking squarely at the facts and acting upon them, our war energies, if they are also applied to the child, will in the physical sense literally regenerate America, while contributing at the same time to the rebuilding of stricken Europe.

As a nation we were long content to ignore the Child in the

presence of the Moneybag, giving to the dollar an artificial value which war has taught us, to our amazement, it did not possess, even though we had been pouring all our foolish energies into it, permitting the Child, our second line of defence, to take care of itself.

Even New Zealand, in spite of its boasted accomplishments, found herself in the Moneybag class until she discovered the lamentable deficiencies of the young men who applied and were examined for her military service.

Dr. Truby King in February, 1918, stopped off in New York on his way to England to reorganise child welfare work under the British Government. Through him we learned that the young men of New Zealand who were supposed to be supremely fit for military service were found by Major General Sir Frederic Morris so lamentably unfit that 60 of every 100 examined had to be rejected.

Tracing their unfitness to its cause, Dr. King was forced to the conclusion that New Zealand's absurd food habits, quite similar to our own, were responsible for the alarming evils revealed by medical examination.

In 1917 New York City boasted that only 88 of its babies died of every 1,000 born. This infant mortality record, compared with the record of many other American cities, is on the surface worthy of note, but Dr. King is responsible for the reduction of the infant mortality rate of New Zealand not to 88 per thousand, but to 5 per thousand, the lowest rate in the world.

In accomplishing this extraordinary achievement which has resulted in the British Government's recognition of the value of his services, Dr. King openly admits that he has followed precedents established here in America, even though they have been ignored here, and that his success in lowering the infant death rate in New Zealand is due to his having practiced principles developed in the United States.

The shame of it!

We gave our American invention, the submarine, to the Germans. We gave our American invention, the aeroplane, to the Germans.

We have not applied to our own benefit the principles we gave Dr. Truby King for the benefit of New Zealand.

Yes, we have been asleep with the Moneybag under our pillow. We were gassed by its fumes.

What we might have spent to make America the most wonderful human thing under God's heavens we did not spend for that purpose, because in our blindness we could not see the simplest, the most wonderful and the most inexorable of God's laws, as it lay ignored, neglected and broken at our feet.

We are spending that money now. Never before were such expenditures recorded in the history of the world!

We are emptying the Moneybag, but little if any of its contents is being applied to our second line of defence, the Child. No wonder the bitter Bernard Shaw impotently raves over the infant mortality of Ireland!

Dr. Baker has told us of the handicap suffered by France through her fallen birth rate, a tragedy which made it almost impossible to maintain her army at its proper quota.

France recognises at last the importance of the child. Even in England the decreasing birth rate is wholly responsible for the loss of millions of potential lives.

At the Royal Institute of Public Health, June, 1918, Sir Bernard Mallet declared to an audience of London physicians that while the war has filled the graves it has emptied the cradles.

In England and Wales the births recorded for 1913 were 881,890. In 1917 they had fallen to 668,346, a decline of 24 per cent.

Up to the beginning of 1918 England and Wales had lost on the scale of potential lives 650,000 unborn infants. During the same period Germany lost in potential lives the equivalent of 4.5 per cent. of her total pre-war population, Austria lost 5 per cent. and Hungary 7 per cent.

The war up to June, 1918, had cost the belligerents not less than 12,500,000 potential lives. These losses, added to the 20,000,000 casualties of battle, show that race suicide on a colossal scale is but one of the outstanding results of German militarism.

Terrible as are these fruits of a Godless philosophy of life and death, the infirmities needlessly visited upon the living are incalculably more appalling, and the tragedy of it is that they are wholly controllable and preventable.

The hour to face the truth has come. The world steeped in

luxury and seeking only physical comforts, had shut its eyes too long to the very means whereby comfort is attained.

Seeing but not comprehending, reading but not understanding, mankind, chastened by suffering, is beginning again to look to God for the pearls it had cast to swine in its hours of material blindness.

Among those pearls one of great price proclaims its lustre out of the darkness as if by its very beauty it would call all men into the area of its radiance, where reverently they may behold under the softness and sweetness of its light one of the many broken laws under whose benevolent operations, when recognised and applied, disease itself is banished, infirmities healed, health and strength attained.

To the task of revealing the glory of this pearl and its meaning to the reconstruction of civilization, these words and those to follow are devoted.

§ 4—MEANINGLESS PHRASES

In the last four years 1,500,000 children under ten years of age have died in the United States. With little knives and forks, with little baby spoons, with chubby little hands manifesting many of the outward signs of health, they dug their little graves.

Hundreds of thousands of adults hurrying to untimely graves kept them company. Why?

As late as April, 1918, the United States Public Health Service called attention to one of the many preventable ravages of food folly.

"There may be plenty of milk or eggs or meat," said the government, "but if you prefer to live mainly on cereals, starchy foods and sweets pellagra will result."

This warning will not be heeded because the people cannot understand it. They do not know what the government means by "cereals," for the reason that 90 per cent. of the cereals now prepared for human consumption in no manner resemble physiologically the cereals provided by Mother Nature.

The government's phrase "starchy foods and sweets" has no

meaning for the plain people who do not know that pure starch or pure sugar are not found in nature.

Pure starch and pure sugar are laboratory refinements from which the "impurities" essential to life have been removed.

The government's phrase "pellagra" has little significance for the average man or woman because "only 150,000 cases" occur every year in the United States, and until a few months ago the entire medical world attributed its outbreak to every cause under the sun except the right one.

The government now knows that pellagra is a food deficiency disease, but there are a hundred stopping places this side of pellagra, every one of which is a direct attack upon our second line of defence.

Our Washington authorities, although they have occasionally spoken in plain terms, do not now refer to the menace of "refined" cereals, of "improved" starches, of "denatured" sweets and fats, of "patent" wheat flour, of "degerminated" corn flour, of "polished" rice, of "demineralised" corn starch and potato starch, of "robbed" rye flour, of "pearled" barley, of "refined" sugar or of any of the other manipulated foods sold in beautifully decorated packages that attack the vitality of prospective mother, nursing mother, child, soldier and civilian worker.

It is not enough that we heed these evils before they reach the pellagra stage.

Where there are but 150,000 cases of pellagra there are millions of cases of malnutrition which, though they do not reach the pellagra stage, are nevertheless symptoms of the great national folly which commercial science encourages and defends.

"The increased price of food is responsible," says Dr. Baker, "for the 216,000 children of New York City now suffering from undernourishment."

"It is most important," says the United States Public Health Service, "that at least three glasses (one and one-half pints) and preferably more milk be taken daily." The irony of these comments is solemn.

The importance of eggs, fresh vegetables and fresh fruits is emphasised as in the past has been emphasised the importance of whole grain foods, whole wheat bread, whole corn bread, natural brown rice. But what are the facts?

High prices do not keep these "offsetting" foods out of the hands of the poor. They are not offered to the poor at any price. Yet the government itself tells us that among the poor the symptoms of malnutrition are mostly prevalent.

On page 484, No. 14, Volume 33 of the Public Health Reports issued by the United States Public Health Service, are found these words:

"The unbalanced diet composed mainly of biscuits, corn bread, grits, hominy, rice, gravy and syrup with only a few vegetables develops disease."

Why such foods develop disease, and why all other similar foods, of which these are but typical, develop disease, will be explained here in the government's own phrases, although they are phrases rarely acted upon by the individual and never by the food manufacturer.

We now know that our second line of defence is in danger. A little later we shall clearly see why.

"The time par excellence," says Dr. Truby King, "for the growth of the brain and nervous system is during the prenatal period and the first two years of life.

"The whole future of the individual is determined for him before he is four years old, just as that of a calf is determined by the time it has reached the age of six months.

"That so many newly born infants survive in spite of the heavy toll taken among them is due to the fact that nature safeguards the child even at the expense of the mother's health."

This is indeed true but the mother's health is also part of the second line of defence, and proper food for her is just as important as proper food for the child; just as important as proper food for the workman; just as important as proper food for the boys in the trenches.

Our moneybags must be opened still wider. Their contents pouring forth cannot longer ignore these facts. We must know what proper food is; we must deal with forces able thus far to prevent the government's acting upon facts which the government itself has succeeded in establishing. That they are pigeonholed in Washington makes the task less difficult.

At this trying period in our national life, when we are bearing intense strains, the food of the plain people, measured by govern-

ment standards, is more impoverished than ever. The function of the Food Administration as determined by itself was not to educate the public.

High prices and restricted diet mean wealth for a few profiteers, but such wealth does not flow into the war chest, nor into the reconstruction work that for many years must be done, nor does it prepare America for the future she now faces.

All will accept the proposition that the stricken parents of children who die before their time should move the world to avert these preventable tragedies, but the impulse rarely asserts itself until all is over.

The time to educate parents is not after the child is laid low. All the food knowledge this side of heaven will not put life and health into the tissues of a corpse.

Parents, clinging to old-fashioned traditions, knowing little of what goes on behind factory walls, are prone to regard the work of child conservation as a fad.

As a rule they refuse to accept the plainest facts unless proved in picturesque fashion. Fortunately, such picturesque proofs are at hand.

We shall peep behind traditions, if only for the purpose of receiving a shock that will excite our curiosity. Such shock is near.

Most of us will not stir from the beaten path tramped hard by the millions of feet of little children unless we are pushed by brute force. Brute force is happily available.

In the last four years in the United States 3,000,000 little feet have ceased pattering. This is not an idle statement made in a year of sensations. Its proof is found in the mortality statistics prepared by the Bureau of Census, Department of Commerce, and submitted to the Secretary of Commerce by the Director of the Census.

Gruesome? Yes.

True? Yes. But what of it? unless we are ready to take soundings, even though to do so means parting with much old-fashioned indifference that sits on an eggshell of happiness, ever ready to crack.

§ 5—APPROACHING REFORM

There is a peg in your shoe. It hurts your foot. It bruises and cuts the flesh. It sets up an irritation. You consult a doctor. He applies oils, lotions and germicides. He bandages the sore spot. You continue his treatment but complain that your foot will not heal.

Of course not.

Some day it may occur to you to remove the peg. Nature will then do her own healing, but not until the cause of her woe has been removed.

All the serums, antitoxins, tonics and therapeutic agents of medical science will not heal our physical disorders while that peg remains in the national shoe. It is the cause of baffling infirmities that defy the scalpel of the surgeon and the prescription of the physician.

It is the unseen agent whose work laughs defiance at the soundest scientific revelations of the laboratory and clinic.

In Berlin, April, 1913, at the Sixth International Conference on Physio-Therapy, it was named in the following words:

"Natural immunity to disease is very closely allied to nutrition. As soon as a slight disturbance of nutrition occurs the child loses this natural immunity.

"An infection of the mouth with thrush is not possible in a normal-born and breast-fed child. The bottle-fed child is at a great disadvantage as compared with the breast-fed child.

"One-sided nutrition with carbohydrates (starches, sugars, table syrups, candies, white breadstuffs, denatured breakfast foods, refined cereals) injures the immunity of children.

"Tuberculous children nourished with such carbohydrate foods succumb more easily than when nourished on natural foods.

"The water content of the body is inversely proportionate to the natural immunity. Water-logged tissues lose their immunity. Refined foods increase unnecessarily the amount of water in the tissues, and promote a rapid rise in the body weight.

"Children fed on a carbohydrate diet become water-logged, fat, and show slight resisting power against infection.

"The lack of absorbable calcium salts in the diet favours the water-logging."

These words, describing the peg, may mean little to you now, but before we have proceeded far they will be repeated under such clear white light that you will marvel over their wisdom and simplicity, seeing that many of the miseries which we rashly and presumptuously attribute to Divine Providence are visited upon us not by God but by ourselves.

To understand the meaning of the phrase "our daily bread" we must first discover how the food manufacturer operates; what he does to accomplish his purpose; why he does it, and how to put an end to his trickery without the necessity of invoking legislation. Legislation will not bring about reform. Politicians, food industries and newspapers will not permit it.

We must first learn that the greatest temptation to juggle with food products is inspired by the people themselves.

The subject of insufficient wage or industrial injustice is not going to creep into this discussion, but in passing it must be said that in scanty incomes is frequently born the false standard of judgment which attributes an artificial value to "bulk," overlooking substance and quality.

Competition, when based on quality of product and honesty of workmanship, is the very life of trade decency, but in foolish and desperate competition which inspires fraud, false standards are imposed in all their evil influence upon society.

When the size and price satisfy the individual few questions are asked. Most people are prone to accept even the shape of the package or its colour as evidence that its contents are all they ought to be. No questions are asked as to whether they will support life or slowly, insidiously, stealthily burrow under the foundation of the living temple to destroy it.

To gain a trade advantage over a competitor the food manufacturer makes his strongest appeal to the eye. Thus begins the work of puffing, bulking, filling, extending. Then follows the trick of conferring upon the bulk product that shadow of honesty which masks it against discovery.

At this point deception is braced with added flavour, manufactured in the laboratory. The "innocent" and "harmless" mass

is kept from disintegrating by the use of legalised preservatives. Food is embalmed!

In addition to the filler evil the artificial colour evil, the flavour evil and the preservative evil there is a fifth and still more insidious evil responsible for tenfold, yes a hundredfold, more miseries than all the other evils combined.

The filler evil is now regarded as a crime by all State Departments of Agriculture where poultry food, cattle food or fertiliser is concerned.

The Federal government also recognises the filler evil when an attempt is made to ship a sophisticated food from one state into another, unless its manufacturer leaves in the form of small print upon the label, some inconspicuous tell-tale evidence behind.

Foods consumed in the state in which they are manufactured, not passing into any other state, need not declare this tell-tale evidence except in a few communities where an alert commissioner is active.

The experiment stations of nearly every state in the Union have discussed the enormity of adulterating cow food and earth food. These abuses have been followed occasionally by successful prosecutions, never heard of by the plain people, although they are based on no other ground than the evil so complacently tolerated in the preparation of human food.

Cattle food and fertilizer are considered by the State and Federal government of more importance than human food.

The reasons behind this inconsistency will be revealed in their proper place.

Dr. Harvey W. Wiley's first work, back in 1882, was the ejection of worthless fillers from the earth-food fertilisers sold to farmers for replenishing their soil with the food elements consumed by last year's crop, that there might be no crop failure the following year.

Commercial cow food, loaded with inert and foodless substances, was found, like commercial earth food, to fail utterly in the work it was intended to accomplish. Now, after 37 years of literally astonishing experiments with soil, plants and animals, and with an almost thorough knowledge of the cause of soil starvation and the cause of animal disease, the human family still persists in ignoring the meaning of pure food for its children.

Those who manufacture foodless foods for human beings tell us we have no constitutional right to interfere with their industries. Education of the masses, however, will bring about the necessary reform. It can be brought about in no other way.

§ 6—RED BLOOD DEPENDS ON FOOD

In the vast mixture of greed, ignorance, selfishness, oppression, sickness, darkness, vanity, sham, crime, love, compassion, justice, charity and truth which we call civilisation, nothing but nation-wide publicity will accomplish for pure food what legislation has failed to do. Enlightened selfishness is not the noblest motive but it frequently leads to noble ends.

Newspapers and magazines through which the public obtains a large share of its canned information cannot now tell the truth about foods because their principal sources of income are derived through the advertisements of the very foods which truthful columns would be forced to condemn if they referred to them at all.

The publications which remain dumb to the most important issue of the home fail to see that by exposing the truth they would automatically develop advertisers to take the place of those whose truth-suppressing policies have sealed their pages with unholy silence.

The business managers of periodicals and dailies have said to me in substance, "Eagles, crows, squirrels were never taught anything of food; see how they thrive. Why create a controversy where there is none?

"In its home among the trees the monkey is ignorant of the meaning of pure food. No hunter ever captured a monkey in its schoolless habitat suffering from appendicitis, tuberculosis, tumour or swollen glands.

"The angler catches his hundred fish; the trawler's net catches its millions. All are healthy, firm and fit for the frying pan and grid.

"The horse is immune to tuberculosis. So is the sheep.

"Of every 10,000 sheep killed in the slaughter house the

lesions of disease are found in only one, and sometimes not even in that one.

"Our fathers and mothers were taught nothing of pure food, yet millions of us are still alive. If pure food had been necessary we would all be dead.

"This certainly proves that knowing nothing of the meaning of carbohydrates, proteins, fats and ash, we do not need to know."

By such phrases the subject is dismissed, yet by such phrases do they who oppose the truth stand convicted.

Remove the monkey from its natural home and its natural food and the superintendent of the menagerie will bury it before its time.

Come with me to the zoological gardens in Bronx Park and see for yourself what happens to the chimpanzee in captivity. All the primates die before their time. Tuberculosis, pneumonia, tumours, kill them.

Later I shall tell you what they eat and why they die.

Nature's formula and man's "improvements" upon it have nothing in common. Pollute the streams and change thereby the character of the food upon which fish subsist and they are no longer fit for the dinner table.

Debase the food of the horse and sheep as we debase the food of the milch cow and they, too, like the cow, are cursed with disease.

Our government is responsible for the assertion that scarcely a single herd of dairy cows in a thousand is free from disease. No tuberculin test of any herd in New York, including the so-called "certified" herds, has failed for eight years to find tuberculous cows. They are in every herd, and in many herds every cow is affected.

All animals have natural instincts to guide them in their selection of food until they are caged, harnessed or put into a stall.

The human animal possesses intelligence rather than instinct. His failure to exercise this intelligence is responsible for the thousand ills which his ignorance imposes upon innocent children.

The divinely constituted truths, with which man should be familiar, reveal to him, if he has the heart to face them, why some plump children are pale, why some pale children are thin, why

some children with normal red blood haven't an ounce of useless fat upon their bodies.

The weight of the child has little to do with its morals, but the poorly nourished child manifests many abnormal characteristics which wise people tell us are "evil."

Many a little heart pumping impoverished blood to hungry tissues, feeding starved nerves with an unhealthy stream, nourishing a tired little body and a wearied little brain with debased foods goes for correction to the Children's Court, or is "punished" for the pranks over which it has no control.

You have seen "bad" children, "cranky" children, "peevish" children, "cruel" children, "reckless" children, "nervous" children and "delinquent" children. Many of them, after a diet of six months on the food God intended they should eat, can preach sermons to their elders.

The angels—perhaps they can weep—know this, yet the world disregards the most beautiful of nature's laws in its consumption of degraded, debased, denatured foods, and then murmurs against God, blaming Him for the prevalence of disease upon the earth.

Food, of course, has nothing to do with man's natural inclination to evil; nothing to do with the weakness of his will. Food will not confirm him in grace, but it will irritate and kill him, and before the end it will make those about him miserable, affording them ample opportunity to practise the heroic virtues of fortitude and patience.

In the creation of our esthetic dishes there are constant wanderings into fields far from nature's own.

We need not consider the normal fish, the healthy monkey or the disease-resisting sheep. Let us consider instead the hundreds of thousands of cases of cured tuberculosis among men, women and children. Hope and faith are carried again on joyful backs, when victims of this preventable affliction return to nature, eating the foods that re-create normal blood, providing anew resistance to disease, and vigour that had been lost.

New red blood arrests disease, walls up tuberculous lesions, and the patient, if not in the very shadow of death, is reclaimed.

New red blood depends on food, on food alone.

§ 7—FOOD CALCIUM AND TUBERCULOSIS

The worn out body suffering from low resistance and tuberculosis can be cured.

What, then, is society's justification for permitting tuberculosis to develop in a healthy body?

Go to the morgue; witness the autopsies; ask a surgeon what causes the scars in the lungs and glands before you.

He will tell you the scar is a healed wound, a calcified lesion.

That dead body, while living, suffered tubercles to feed upon it, yet never suspecting their existence threw them off and was cured.

Thousands of cases of accidentally renewed vitality overcoming the ravages of tuberculosis are on record.

Physicians report their continued surprise in the number of instances of cured tuberculosis, evidence of which they find in operations or in post mortems among adults and children.

Calcified lesions, completely walled off from the rest of the body, are common. They show how nature, when given an opportunity to thwart the advance of the disease, performs her protecting task without exciting the faintest suspicion that the disease is present.

There is no combination of foods, if consumed as nature gives them to us, which can fail to fortify the growing child against the ravages of tuberculosis. All food, if unrefined, is good food. Let there be no mystery about that. Food, unprocessed by man, contains all the elements necessary to a successful journey through the human body. That God put them there for a purpose we shall prove.

In nature there are no irritating tables of proteins, carbohydrates, fats or ash to vex the child. It is the breaking down of nature's schemes which over-emphasises the importance of these curious subdivisions into which man has learnedly split his dietary.

Any combination of natural foods, unrefined, which you can think of, will place at her disposal the raw materials needed by Mother Nature not only in her process of curing tuberculosis, but in her function of protecting the body against it.

In an earlier chapter we heard the Sixth International Con-

gress of Physio-Therapy tell us that the lack of absorbable calcium salts in the diet favours loss of resisting power against infection.

Remember those words, for as they zigzag their course through what is to follow they will gather many new meanings, every one of which will be as transparent to you as distilled water.

Absorbable calcium salts (organic lime) constitute the building materials employed by the body in plugging the tuberculous gap. With organic lime and its accompanying salts, furnished only through food and never through medicine, the body builds its fortification against tuberculosis.

When the surgeon's knife cuts through a healed tuberculous area the effect is exactly like that which follows an attempt to cut sand.

These calcified lesions complain of our folly in remaining deaf to the beautiful rhythms playing everywhere about us, reminding us constantly that in creating earth for man God in His wisdom neglected nothing, left nothing to chance, but rather from His infinite Providence provided for every human need, heeding not alone the requirements of the new born infant at its mother's breast, but also the requirements of the adult, if the adult will but bend his knee and bow his head, accepting without question the dispensations of his Creator's love instead of capriciously breaking in upon them, disordering, changing, improving, refining, destroying them.

Pure food not only endows the child with disease-resisting vitality, but it promotes and controls its normal growth and development, and fortifies maternity against the many preventable evils that beset the sublimest episode of life.

Pure food is designed to keep the cradle filled and to stand the grave off to its proper time.

It is designed to carry its lesson to stricken Europe, whose under-nourished children, like our own, now need more attention than ever.

It is designed to erase the horrible records of childhood mortality and to substitute for them the cheering fruits of decent and humane consideration for the physically defective so frequently condemned to meaningless misery, and premature death.

These chapters will trace the fortunate accident that even in ignorance sometimes removes the peg.

They will locate that peg. They will reveal the operation of a beautiful and harmonious law. They will make plain the natural processes which, when applied, can be substituted for the accident that sometimes intercepts the journey of a useful creature on his way to untimely death.

The proper place to teach the mysteries of food is in the school, but even we who were not taught there can begin now to learn with inevitable increase in the number of our days, and blessings untold to our children.

The most indifferent of us know that chicken food must be food that will make chickens grow and keep them well. There is such food upon the market.

Children's food must perform the same service for children, but there are hundreds of foods now on the market which children eat every day. These foods in six weeks will destroy the health of chickens, and in three months kill them.

They do not cause children to topple over on the streets in paroxysms of pain. They do not bring about sudden death. They rob the child a little at a time, slowly but surely undermining its vitality and lowering its resistance until eventually it becomes the ready victim of any disease organism that may take up residence in its tissues.

The same law of building with building materials operates for children and chickens.

Universities have not yet been able to suspend the law, though some of them have sought to change our notions regarding its divine origin.

§ 8—DENATURED FOODS DESTROY LIFE

Animals, human or dumb brutes, die when their food is debased, but the very number of such foods makes it impossible for an individual to go before a grand jury with the charge: "This food killed my little girl."

For months, perhaps for years, one juggled food brought substances to her diet which her little body could not use. Her vitality in throwing off the excess baggage was slowly sapped.

She was not poisoned by any particular food. A combination of inadequate foods merely robbed her tissues of their tone.

Another food from another source had been processed in a manner that removed some or all of its most indispensable elements. In its refinement it withheld from her little frame the very materials she required for growth, materials that God had elaborated for her, but which unnatural practices had withdrawn from her reach on the vain assumption that it is not necessary to credit the Creator with a profoundly conceived and marvellously executed scheme of biochemic balances and harmonies.

Persistently, month after month, the disordered combination of artificial foods sallied to the dinner table, where all the forces of outraged nature were called into battle with the unseen enemy of health and life.

Commercial expediency looked on as the fight was waged with nature but nature had been equipped with poor fighting materials and the child's resistance, broken at last by the combined attack of unsuspected enemies, buckled, snapped and was gone.

There is no pathologist, no public prosecutor, no father or mother who can accuse the food industry of her death. Let this be fully understood.

Before we can correct a single refined food abuse, by law, we must produce in court the body of a dead child, and prove that life was destroyed by a particular food.

Scientists will be on hand to testify in behalf of the defendant. Food manufacturers have been paying scientists for twenty-five years to testify in their defence.

I have listened on hundreds of occasions to their testimony in adulterated food cases, and in many instances I have seen their sophistries fail, but the facts have rarely been reported to the public.

The fear of advertising losses, as we have seen, has closed the columns of most newspapers and magazines to the truth.

Judges, confused by the conflicting testimony of experts, have in numerous instances imposed fines of $5 upon wretches for preserving milk with formaldehyde; for salvaging the flesh of diseased animals for human food.

Not a word of these heinous crimes or the travesty of justice which flows from them filters out to the public.

Cases in which deadly wood alcohol has formed the base of vanilla, lemon and other flavouring extracts have been dismissed with a suspended sentence, not a soul outside the court room hearing an echo of the facts.

Confectioners who have used arsenical preparations in the glaze with which their penny candies were weather-proofed have been let off with trifling rebukes, and the public has been none the wiser.

Foods that kill mice, rabbits and guinea pigs are not "harmful" to the child in the law's eyes, for the reason that nobody is willing to feed a child on an exclusive diet of such things until it dies, in order thereby to produce, as evidence, a dead body in court.

Fortunately, when it is argued that chickens or other experimental animals are not human beings, and that therefore any deduction based on barnyard phenomena are unwarranted when applied to humanity, we are not confined to animal experimentation for our facts.

The same facts have been established in the most startling and dramatic fashion, hundreds of times, upon human beings. The fascinating narratives which these human poison squad experiences provide for our enlightenment and use will be related here in all their significances. Dramatists and novelists have strangely overlooked the intense human interest with which these weird episodes literally scintillate and thus the general public has never heard of them.

In Billibid Prison, Philippine Islands, 1912, twenty-nine criminals under sentence of death were fed exclusively on refined and denatured foods of the kind most common in America for the purpose of determining the effect of such diet.

Their chief food consisted of polished rice. In six weeks the condemned men became anemic. Their first symptom was slight edema (water-logging or swelling) of the feet and ankles which disappeared after lying down. Puffiness beneath the eyes, with general weakness and pains in the legs, soon followed.

Later the edema became massive, involving even the thighs. Then came marked apathy with muscular wasting and extreme pallor. Finally, an enlargement of the heart with feeble heart action.

It is noteworthy that the symptoms of war edema reported

among German, French and British soldiers, 1916-1918, are identical with these.

Commenting on the Billibid experiments, Drs. R. P. Strong and R. C. Crowell stated: "These diseases developed owing to the absence of some substance or substances in the diet necessary for the normal physiological processes of the body. Without a supply of such substances in the food sickness results." This comment in all its vagueness disclosed the poverty of food knowledge possessed by the medical profession six years ago.

The prisoners fed on the denatured diet mingled freely with the other prisoners but there was no tendency of the disease to spread outside the group fed on the polished rice.

When this denatured food was removed from their diet and whole natural brown rice restored to them, they recovered promptly.

These are the brief outlines of facts of which you will learn much in striking detail before we have proceeded far. They are cited here only for the purpose of emphasising the ignorance existing as late as 1912 among men who although devoting their lives to the cure of disease did not suspect its cause.

In the near future, depending upon the rapidity with which the truth is spread, it will not be so difficult to bring the body of a dead child into the court room to prove with evidence that cannot be controverted that the murder was committed by depraved food.

§ 9—HUMAN VARIATIONS OF A DIVINE THEME

Perhaps you have heard of the little girl who caught cold easily, and whose mother for that reason kept her home from school on rainy days.

From the pages of "Starving America" published, 1913, by George H. Doran Company, of which work this is an elaborate extension, I again present her to you for the reason that she symbolises millions of her kind.

She went one day to a playmate's birthday party at a neighbour's home. Set before the children was a great frosted cake with lighted candles; ice cream bricks striped with red, white, green

and brown; candies of seven hues, and a riotous assortment of goodies that struggled with each other in a debauch of colour to catch the attention of greedy little eyes.

The little merry-makers were transported by the rainbow sweets before them. Angel cake and wafers were consumed without end.

That night the tired but happy little darling was tucked away in her warm little bed by little mother, who was happy too.

In her sleep she fretted and tossed a bit. The next day she did not seem well enough to be sent to school. Toward evening a slight fever had developed.

Her mother called it an "upset."

The fever continued into the second day and the doctor was called. He felt her pulse, looked at her tongue, and asked what she had been eating.

When the party was described he smiled and said: "She has eaten too much."

He gave her medicine and in a few days she was "well."

The doctor had not taken into consideration the fact that the milk of which that richly decorated ice cream had been made was raw milk; he did not know that a microscopical examination of it would have revealed millions of organisms to the cubic centimeter, much less than a teaspoonful.

He did not attach much importance to the fact that many of those organisms were of the pathogenic or disease-producing type, and that the simple but effective remedy against them, pasteurisation, had not been applied.

He little heeded the fact that once infected, neither milk nor its products, ice cream and butter, are made safe by anything but pasteurisation or sterilisation.

He did not recall that low temperature or even freezing has no effect on the disease germs of milk, and does not destroy the tuberculosis, typhoid and diphtheria bacilli, the highest exponents of milk-borne infection.

He did not know that the ice cream, sent in from a store, was stiffened with a bodifier made of commercial gelatine, more truthfully classified as carpenters' glue, which the Bureau of Chemistry at Washington has found to contain as many as 6,000,000,000

organisms to the gram, of which there are twenty-nine in a single ounce.

He did not know that glue, containing sulphites, copper and arsenic was originally intended as wall paper sizing, or for use in the paper box factory or furniture shop, but that through the cupidity of the wholesale bakers' supply houses it had been appropriated for use in confectionery, ice cream and cake.

He did not know that the marshmallows consumed by the child consisted of glue, sugar and a coal tar dye.

He did not know that the coloured candies were made chiefly of glucose, sweetened with 10 or 15 per cent. of sugar, flavoured with ethereal extracts and ornamented with ribbon dyes.

He did not know that the soft drinks, pop, consumed by the child were sweetened with saccharine, contained soap bark for "suds," were coloured with dye, preserved with salicylic acid, benzoic acid or formic acid, and flavoured with esters, ethers and aldehydes.

He did not know that small town "pop," as well as big city "pop," contains as a rule not a single ingredient recognised as food.

He did not know the destructive action of refined glucose and refined sugars when excessively consumed.

He did not know that on such a diet bees are quickly killed, though it has been generally supposed that an abundance of table syrup and granulated sugar is good food for the child.

He had read something of the high calorie value of sugar, and glucose, but had not stopped to consider that alcohol and gasoline have a much higher calorie value.

He did not know, as we are going to discover a little later, that "high calories" although a scientific phrase, is not only meaningless but dangerous when applied to food as it is being applied to-day.

The little party as a single instance of childhood dissipation did no particular harm to its victim except perhaps to infect her through the ice cream with the germ of bovine tuberculosis, although every time she consumed a glass of raw milk of unknown origin at home she encountered the same danger.

The significance of the little birthday party lay in the fact that all the delicacies served to the romping children were merely

typical, under other forms, of the refined foods so generously incorporated in the every day diet of the American people.

We are to learn why our little girl caught cold so easily, and why it seemed difficult to cure those colds, and why she had so many periodical "upsets."

Of what did her breakfast consist?

There was, of course, the usual coffee, which no child should ever consume, and the usual rolls, toast or pancakes with glucose syrup, with one of the many popular breakfast foods served with milk produced by cows fed on brewers' grain, beet pulp, distillery waste, cotton seed meal and gluten feed, a by-product of the glucose factory, compounded black strap feeds, containing ground corn cob, oat hulls, peanut shells, buckwheat hulls, cottonseed hulls, rice hulls, cocoa shells, chaff, elevator screenings, shredded straw, plant refuse, dirt and sand.

"Is this not the breakfast of millions?" you ask.

Of what did the "breakfast-food" consist?

Breakfast foods made of wheat, corn, barley and rice must "keep"; they must "look nice."

The corn flakes, the farina served under trade names in fancy packages at high prices but purchasable in bulk without the fancy names at half the price, and the puffed rice are merely other forms of angel cake and wafer without the sugar and eggs.

They represent but the starchy part of the grain from which the many wonderful substances we are about to describe have been removed for commercial reasons.

At noon, as father did not come home for lunch, mother fried the potatoes from last evening's meal, and perhaps added a bit of bologna in which in the uninspected establishments, of which there are thousands in the United States, the raw flesh of the rejected dairy culls (old and diseased cows) is utilised.

White bread and margarine, with syrup, were present in abundance. They were always present!

§ 10—NATURAL IMMUNITY VERSUS BUSINESS

Our little girl liked white bread or biscuits, deluged with table syrup, for lunch. Her mother did not know what life-sus-

taining substances had been removed from the bread and the biscuits, or what had been taken out of the hydrolised corn starch that produced the syrup.

She also liked jam purchased from the store, with its 10 per cent. of fruit and its 10 per cent. of apple juice, made from the sulphured skins and cores of the dried apple industry; with its 70 per cent. of glucose, sweetened with 10 per cent. of sugar, held together with sufficient phosphoric acid to supply the jelly-ing quality, and preserved with the classic one-tenth of 1 per cent. of benzoate of soda to prevent the mass from disintegrating.

You did not think such jam as this is to be found in America.

Examine the fine print on the labels of the jars sold in the stores; examine the fine print on the labels of the thirty-pound pails sold as "pie filler" and "cake filler" to the baker. More than 70 per cent. of all the commercial jam consumed is exactly like this.

Our little victim liked the bright strawberry hue of the sweetish stuff. This hue had been contributed through the legal use of a coal tar dye known as amranth.

Only one-tenth of 1 per cent. of benzoate of soda was declared in fine print on the label, and her mother had never noticed even that.

Before the war, when benzoate of soda did not cost $5 a pound, the presence of as much as five-tenths of 1 per cent. in many foods was determined by the Commissioner of Agriculture of the State of Georgia. The facts were reported to the state chemist in serial No. 56.

To-day formic acid and other preservatives less costly are secretly employed.

The little girl's doctor did not know this; moreover he was not worried by the presence of a little benzoate in her jam.

She was also fond of pickles, hardened in a bath of alum, the astringency of which prevents the softening of their tissues.

Her father and mother had not been taught the chemistry of food in the schools, nor the relationship which refined food, juggled food, and drugged food might some day bear to their anemic child.

The evening meal was well suited to the father's needs. It consisted of chops or pot roast or sausages or baked beans and ham

or liver and bacon, or kidney stew, with vegetables and a bakery pie, or a home-made pudding, white with corn starch and milk or brown with corn starch and chocolate, or pink with ribbon dye.

The ever-present white bread and something that resembled butter was, of course, consumed in abundance. It was the average American meal as you shall see from authority much higher than mine, government authority, and it is the average American meal with which we are concerned.

During the afternoon a candy shop down the street received many of the pennies of the little girl. It had existence for the purpose of attracting those pennies. At least twenty-million such pennies are spent each day in the United States by school children.

Thus she feasted between meals on dyed glucose and chemical flavours, with an occasional ice cream soda to add romance to her little life.

Delicate always, anemic and "nervous," she had been treated by the family physician for tonsillitis, acute chorea and anemia. At the age of six she underwent an operation for adenoids. Every year among children there are more than 200,000 such operations in the United States.

She had also taken a tonic of iron and manganese. Remember these words, "iron" and "manganese."

On other occasions tonics of strychnia were prescribed.

Her teeth, like those of millions of children, were decayed. Mother was anxious about her, and at times would say, "I wonder if we feed Helen properly?" But Aunt Jennie always answered, "Her ills are natural to childhood, and are to be expected. The sooner she has them all the sooner she will be done with them."

Moreover, the neighbours told mother that the less attention she paid to her child's food the better, because people who were always worrying about food had the toughest luck. Here and there a "plump" child was pointed out as a model of what eating "anything and everything" would produce.

The neighbours did not know that water-logged tissues are frequently mistaken for plumpness, or that plumpness has nothing to do with muscle tone, with normal functioning of the glands, with vitality or resistance to disease.

The neighbours did not know that the "plump" child, fed on "anything and everything," succumbs more quickly than the well-fed, muscular but thin child.

Grandmothers and mothers had fed children for ages, and surely they must know a little about their business, so after all little Helen's mother felt that the child would eventually outgrow her poor health. "She just wasn't strong" but "would get strong." It was a comforting thought.

A few weeks after the little party, as Helen was going home from school, she was caught in a rainstorm. Mother changed her clothes promptly upon her arrival and gave her hot lemonade.

There was another fever and the doctor was called. When he came he uttered one word, "pneumonia."

We now know, for the Census Director at Washington has told us, that every year in the United States 400,000 children under ten years of age are buried, as little Helen was buried.

Such are the facts. They cannot be disputed.

The apparent cause of the child's death was pneumonia; the real cause was malnutrition, followed by low resistance and inability to fight off the pneumococci.

Man's methods of endowing his children with natural immunity unfortunately involve a side issue of "business expediency." God's methods disclose no such taint. By following the divine hints that lie at his feet man can still have his business without the tragedy on which it is built.

§ 11—THE NEGLECTED CHILD OF 1912—THE SOLDIER OF 1918

We have learned with shocking surprise that in the last mortality statistics issued by the Census Director at Washington, there were reported in the United States for one year the deaths of 400,000 children under ten years of age.

The record of these deaths was compiled in what is known as the "registration area," which included only about 65 per cent. of the total population of the United States.

The total deaths in the "registration area" the year before the

war, 1913, were 890,848, of which all but 70,644 were of white persons.

The "registration area" covered few Southern states in which the negro population is large. It is thus seen that the high mortality record of the negroes has in no manner affected these figures, which would be still larger if the negro population were taken into consideration, or if the entire country were reported upon instead of but two-thirds of it.

Lamenting the fatalities of war we are unmindful that during the past four years, while men on the battle-fields of Europe were being killed by fire and gas, 1,500,000 children under ten years of age were dying here at home in the United States.

Because they did not die in a massacre, their deaths failed to rouse the nation.

When the *Titanic* and the *Lusitania* went down with a few more than 2,000 souls aboard, the cities of civilization put on the cloak of grief. A few thousand perished, but they perished in a heap.

In one instance a block of ice, in another an enemy was responsible.

Following both catastrophes every newspaper in the United States poured into the streets millions of first page lamentations. Men were dazed because these tragedies came quick and sudden.

The slow-moving, deadlier peril that walks among their children by day and lies with them at night arouses no man.

As long ago as 1912 the United States Bureau of Education prepared a bulletin warning us that here in our own peaceful cities of America

400,000 children had organic heart disease.
1,000,000 children had tuberculosis.
1,000,000 children had spinal curvature.
1,000,000 children had defective hearing.
4,000,000 children were suffering from malnutrition.
6,000,000 children had enlarged tonsils or other gland diseases.
10,000,000 children had defective teeth.
15,000,000 children needed attention for physical defects prejudicial to health.

Many of those children were then boys of fifteen. Since then they have passed through the medical examination of the draft of 1918. The defects of 1912 had become intensified during the

interim. The re-examination of 1918 disclosed the nation's crime of neglect.

Yes, the neglected child of 1912 presented himself for efficient military service in 1918. The nation that had ignored his perils in peace expected him in war to step into line with a whole body.

Do you not think it time to ask the reason why these figures are on the books against us?

Do you not think it our duty to heed the truth and apply it?

To all who think so these words are addressed.

We know in the last year reported by the Census Directory at Washington, 159,435 infants under one year of age perished in the United States.

This sacrifice of infant life indicates that nearly 200,000 American women annually enter the shadows of motherhood unfit to bring their children into the world. The facts are brutal, but by ignoring them or by refusing to look into them because of the grim depression which accompanies the contemplation of such a holocaust, we betray our unworthiness of the sacrifice made by our sons and brothers on the fields of France.

They struggled and died to make the world a better place to live in. Shall we hesitate to match our living efforts against their blood?

By seeking the cause of America's slaughter of the innocents, in order to act upon it, we prove that in some measure at least we are worthy to account for our stewardship of the lives submitted to our care.

If, in 1918, a hostile army had invaded our shores to put to death 400,000 of our children as the Turks put to death the Armenians, as the Prussians put to death the Belgians, there would have been cause indeed for weeping and wailing and gnashing of teeth.

That hostile army has invaded our shores, and is now ruthlessly destroying our children. It is the army of ignorance, indifference, complacency, selfishness, greed, materialism.

The crowds in the market places, in the cars, on the streets, in the theatres; the crowds scanning the casualty lists, hoping that the names of their loved ones would not be there, gave no thought even in the year of salvage, 1918, to the waste of life going on around them.

"With desolation is the earth made desolate, because no man thinketh in his heart."

Therefore we experience little indignation when self-appointed leaders declare an intolerance for what they describe as "mistaken regard for what are believed to be divine laws and a sentimental belief in the sanctity of human life. Such is the philosophy of Madison Grant who holds that slaves are more fortunate than free men and the subjects of an aristocracy happier and better than the citizens of a democracy.

These anti-American doctrines are advanced boldly by the councillor of the American Geographical Society and a trustee of the American Museum of Natural History in his "The Passing of the Great Race," published, 1916.

From such doctrines what shall America expect?

§ 12—WHAT OUR TEETH DISCLOSE

Although more than 100,000 deaths from tuberculosis are reported in the United States every year, these figures represent only the number who perish, not the number afflicted or incapacitated.

In the last year reported, covering but two-thirds of the population, 58,973 died of diarrhœa. This number does not include those who were stricken during the year and recovered.

Indicating fatal cases it also discloses the wide prevalence of dietetic folly in non-fatal cases.

Cancer, rapidly increasing, was responsible for 49,928 deaths. The American Society for the Control of Cancer through Dr. Charles E. Lakeman, reported in 1915 that we then had 80,000 new cases each year in the United States.

Bright's disease, also increasing, with acute nephritis, was responsible for 65,106 deaths.

Cancer and Bright's disease, both of which are now being traced to food abuses, in one year were responsible for 135,034 deaths, leaving hundreds of thousands of victims in the valley straddled by lingering death.

Diabetes also is on the increase.

Before abandoning these facts established by the Census Director at Washington, let us consider two diseases—cancer of the stomach and heart disease—both of which take a progressively heavier toll every year.

The rate for 1913 was the highest for any year during the period dating from 1900, just as the rate for 1912 was the highest shown for any previous year. The rate for 1917 shows a steady and continuous climb, and thus far in the mortality statistics kept by the City of New York for 1918, the increase actually smudges the chart on which it is recorded.

The Census Director declares: "It is probable that many deaths reported as due to 'tumour' are in reality caused by cancer, but as far as the cancer total is concerned they are not included."

When this fact is considered with the fact that the "registration area" comprises only 65.1 per cent. of the total population, it is evident that we have in the United States a great many more cases of fatal cancer than are disclosed.

The Census Director continues: "Approximately 40 per cent. of all deaths from this disease were returned as cancer of the stomach and liver."

These facts tend strongly to support the convictions of Packard to the effect that refined and demineralised foodstuffs are directly responsible for the prevalence of cancer.

Of the 87,755 deaths charged to organic diseases of the heart, the Census Director states: "The tendency has been toward increase in the death rates from heart disease from year to year, and the rates for the latter years are well in excess of those of earlier years."

It will be well to remember that in all disorders of nutrition involvement of the heart is among the first symptoms. Acidosis and anemia which are widespread but notoriously neglected food deficiency diseases, are always accompanied by abnormal heart action, the true cause of which is rarely suspected, and still more rarely reckoned with.

The extraordinary facts about to be presented all tend to prove that cancer, Bright's disease, acute nephritis, diabetes, tuberculosis and organic diseases of the heart are directly attributable to food deficiencies in a land that literally overflows with an abundance of food of a kind that supplies all these deficiencies.

Of course, when 400,000 children under ten years of age die in their American homes every year there is an involvement of the living who still maintain that minimum of vitality necessary to hold them this side the dead line.

We need not speculate as to the prevalence of disease and pain. All over America and Europe public school children are being examined by physicians in search of disease.

Half the children in a school in Leeds were found by Dr. Hull suffering from mineral starvation. Their food had been refined.

Before the war 40 per cent. of the children in the Edinburgh schools were found suffering from diseases of the ear.

Of 10,500 school children examined, the British Dental Association found 86 per cent. suffering from defective teeth, the result of a diet lacking in the mineral substances upon which bones, teeth and tissues depend.

Those who refuse to accept this fact must deal with the results of the experiments of Dr. Geis of Columbia University in his analysis of the mineral content of defective teeth.

In the Dundee school 50 per cent. of the children were found suffering from defective vision. Of 42,750 children examined in 1911 by Dr. William J. Galvin, chief of the Division of Child Hygiene of the Boston Board of Health, 27,795 were described as "defective."

Of 1,694 children examined in six clinics, 1913, by Dr. A. Freedman Foot, eleven were found to possess normal teeth. Dr. Foot, in reporting to the Second District Dental Society of New York, declares: "The six-year molars of nearly every child were broken down wholly or in part. In many instances the molars were decayed through the gums. So extensive and far advanced were the defects that corrective treatment, even if it were applied, would have been of little value."

The New York Department of Health through Dr. T. Van Wincke examining the teeth of 231,081 school children of New York City, outside the dental clinics, found 131,747 defective.

What are the future health chances of these children? Are they to be useful to society or a drag upon the race? Will we need them for war in 1925?

If they really constitute our second line of defence, what are we doing to protect that line?

Full proof is at hand establishing the incontrovertible proposition that defective teeth or sound teeth may be had at will, depending entirely upon the character of food consumed prior to and during the entire period of dentition.

The same character of proof is at hand determining the fact that defective teeth constitute but one of the many symptoms of the grave systemic disorders traceable to refined food.

The American teeth of to-day are among the poorest on earth in spite of the great variety of foods which the American people enjoy.

"No nation was ever so well fed as America."

Alas! such flattery does not compensate for the infirmities so wilfully ignored. Flattery is a poor substitute for the riches God has provided for His children. Those riches are within reach They are abundant. Our hands will soon be upon them.

§ 13—WHY HAVE A SIX-YEAR MOLAR?

Sound teeth are the foundation of health building. The six-year molar is the corner-stone. The school children of America are building upon defective corner-stones or without corner-stones at all.

Why should God provide the six-year molar if He did not intend His creature to use it?

A hundred eminent authorities whose brilliant demonstrations have never been heard of by the plain people now stand on record with these statements: "Defective teeth are symptoms of malnutrition. They indicate that something is wrong with the food supply. The normally nourished possess sound teeth."

Notwithstanding the profound truth nested in this little cluster of words, no symptom of the national health is so grossly neglected as the symptom revealed by defective teeth, even in the face of overwhelming evidence of the soundness of the prophecy that if we persist in ignoring the underlying causes of these defects, America, in spite of the magnificence of her 1918 performances, is destined in 1948 to become a decadent nation.

In June, 1914, Dr. S. S. Goldwater, Commissioner of Health

of New York City, ordered a physical examination of the employés of the Health Department.

Between June and October 240 men and 456 women employés were examined. These 696 individuals represented the average standard of American citizenship. Perhaps because of their education and environment they represented a standard a little higher than the average. At least they should have.

They were specialists in the kind of health-education which the American people now enjoy. As such they should have known something about their own health.

The average age of the men examined was thirty-three and one-half years; the average age of the women thirty-two years.

From the Department labourer to the highest executive officer, a variety of indoor, outdoor and mixed employment was represented.

The report of the examination declares: "One hundred and twenty-three were found to have defective digestion. Habitual constipation was found in the majority of these.

"A great number of young men (notwithstanding their highly polished shoes, carefully creased trousers, bright neckties and clean-shaven faces) suffered from this condition, which if allowed to go uninterrupted has baneful ultimate effects upon the blood vessels, kidneys, heart and nervous system."

In addition to constipation the cause of a hundred other preventable ills, 417 of the entire number suffered from defective vision, defective hearing and defective teeth. Ninety-two had heart disease. Many of these had valvular leakage of which they were entirely ignorant.

They had not died as infants, and they looked like healthy creatures, but within them the forces of destruction were working unseen and unsuspected.

Others, especially very young men with constipation and nervousness, had dilated left ventricles with unstable and rapid heart action. They were a fine, healthy, average looking lot, judged from the outside, and would seem to justify the comforting flattery of the average commentator upon the glory of American public health: "We are the best fed nation in the world."

Just such deceptive judgment calculating from the exterior

only has inspired many American editors to idealise the "superb health" of their fellows.

Were it not for this dangerous attitude toward truth these symptoms would long ago have been interpreted in their true significance, and an honest effort might have been made to provide against them.

Self-flattery has blinded the nation, but the hundreds of thousands of "rejects" cast aside as "physically unfit" in the medical examination of our first draft of 1918 have opened the nation's eyes.

Of our 696 Health Department employés, 232 or exactly one-third were in obvious need of medical treatment, and 327—44 per cent.—were in need of medical advice.

Their diet had not saved them from the infirmities with which they were specialising, even though they had not been included among the 400,000 who as little children succumb every year in the United States to an untimely death.

Commenting on the Goldwater report, Dr. Charles D. Slade, who made the examinations, stated: "Forty-four per cent. of those examined had without their knowledge some vital physical defect which might have shortened their life by a number of years if undetected.

"Those in whom were discovered actual evidence of disease numbered 213 or nearly one-third the entire number."

There was not much self-justification for self-flattery there.

As we advance we shall discover less, but always shall we keep in mind the simple, acceptable, never-failing and truly divine formula, the abandonment of which is responsible for so much human infirmity, and the return to which means so much not only to America, but to that great part of the civilised world which believes in God and trusts Him.

§ 14—"DUST THOU ART AND UNTO DUST THOU SHALT RETURN"

"Dust thou art and unto dust thou shalt return" is a law of life, not a symbol of death.

Dr. Slade, continuing his comments upon the disquieting results

of the examination of the health of the employés of the New York Department of Health, said: "The last ten years have recorded a general reduction in the general death rate in all ages under forty years, but there has been a simultaneous surprising increase in the death rate between forty and sixty years, due largely to digestive, circulatory and kidney diseases."

Back in 1898 New York City had an infant death rate, under one year of age, of 203 for every thousand born.

Heroic efforts to save these lives through the establishment of pasteurisation of milk, infant feeding stations and the work of visiting nurses had succeeded in reducing this death rate at the beginning of 1918 to 89 per thousand, a saving of 114 infant lives in every thousand born.

In 1917 the metropolis reported 141,564 births. In that year 16,139 baby lives were prolonged beyond the first year stage, after which little, if anything, was done for them.

The city "saved" them, glorified its records accordingly, and went about its business, giving no thought to their second year, their fifth year, their tenth year. Now it is focusing attention upon their fortieth year.

What kind of a system is it that will prolong the misery of frail little lives for a year and then pause in its work of redemption? It were better, perhaps, if the babies were allowed to die than to extend their miseries into unknown regions out of which they finally emerge with infirmities that cause them to curse the day they were snatched from the "infant mortality" class and flung into the "physically defective" class.

It were better far for us in our relations with God that we make no attempt to drag out the infirm lives of these weaklings of society unless we continue our work of restoring them to healthy, fruitful life.

Something of the truly inspiring experiences I have had in the physical redemption of broken boys who had been rescued from the "infant mortality" class will be related here in good season.

Certain it is that all childhood infirmities lower efficiency, for which reason public school boards are ordering operations upon children's throats, removing adenoids, correcting defective vision, doing dental work, providing nurses, furnishing meals at cost,

sending "cards of instruction" on hygiene and diet to parents. The charge for these services is borne by the community.

Apparently if the work were not done under school direction it would not be done at all.

The state exercises vast and elastic powers in the regulation of public health and education. Why does the state make no attempt to search out the cause of the diseases with which it deals? Why does the state not warn the people against the hidden enemy that attacks them?

Let me again repeat: the politicians, the food industries and the newspapers will not permit it.

Wherefore, it is the purpose of these words to set down a record of those common but deadly sins of diet which end inevitably in disease.

We shall have to review the nation's crimes against its wheat, corn, rye, rice and barley; against its bread, biscuits, crackers, cakes, rolls, rings, buns, wafers, doughnuts, crullers, pastry, pies, pancakes, puddings, sugars and starches; against its milk, butter, eggs, meat products, fish, poultry; against its molasses, dried fruits, condiments, candies, ice cream, jam, jellies and preserves. All of these foods could be and would be what they ought to be if we refused to tolerate the manipulation of the substitutes that go into them.

We shall tear down nothing without building up. When we are through it will be impossible to go astray in the selection and preparation of the most delicious, appetising and nutritious of foods for our families unless we wilfully decide to do so.

"Dust thou art and unto dust thou shalt return."

If we take a handful of fertile earth into the laboratory and split it into its component parts we find it composed chiefly of some sixteen elements.

If we take a measure of milk, an egg, a handful of wheat or corn, barley, oats or rye, again we find the same sixteen elements, plus at least two marvellous compounds elaborated by the plant, though not in the soil.

These compounds were not known in the modern laboratory until a few years ago, yet Moses proved by his instructions to the Jews that he was familiar with them.

They are called "fat soluble A" and "water soluble B." With-

out them man cannot live, yet he makes an almost fanatical effort, for business reasons, to keep them out of his diet, and succeeds in doing so in at least 80 per cent. of all the foods he eats. From his bread he succeeds in removing them entirely, depending solely upon benevolent chance to obtain them from "offsetting" foods about which he hears so much when he reads the reports of commercial scientists.

When we analyse the body of man we find that it, too, is made up principally of the same sixteen elements found in the soil and the plant. There is no creature alive on the face of this planet whose body does not contain these sixteen elements.

The constancy with which they appear in the soil, in the tissues of the plant and in man's own tissues, and the consistency with which they are found in all unrefined foods reveal the operation of a fixed and inviolable law.

The beauty of this law, as we are about to see, is almost as infinite as the Creator who set its processes in motion. The lore of the libraries contains nothing so bewildering in its fascination, and yet one may consult a million volumes and find no hint of its glory upon their pages.

The elements which operate under this law and which persist through fertile soil, healthy plants and man are oxygen, nitrogen, hydrogen, carbon, chlorine, fluorine, iron, phosphorus, calcium, potassium, magnesium, manganese, sodium, sulphur, silicon, iodine. There are nearly a hundred from which nature might choose but she clings tenaciously to these.

The human body obtains them through the medium of food, and through food alone.

From all the food refined for the use of the human body at least eight of them are removed entirely, and four others are removed to the extent of 75 per cent.

In this clash with God and in all the miseries that flow from it we shall find the very heart of the marvels about to be unfolded.

Penetrating the circles of elemental nature for a few brief hours even the indifferent and the sceptical will behold an invincible defence against the deaths of the 400,000 children under ten years of age who perish in the United States every year; against the nameless pain that remains behind.

The disclosures of the War Department, July 27th, 1918, by Provost Marshal General E. H. Crowder are to be remembered as we enter the depths. The War Department's estimate of effectives obtainable by extending the draft ages from 18 to 45 confirm in startling figures all the facts thus far presented as to the number of physical defectives in the United States.

Of the 1,366,142 men available between the ages of 32 and 45 nearly 450,000 (435,378) are grouped as "physical rejects," leaving 601,236 men fit for service.

Of the 2,568,012 men available between the ages of 18 and 22 nearly 800,000 (770,403) are grouped as "physical rejects," leaving 1,797,609 men fit for service.

Here, then, are 2,568,012 mere boys of whom nearly a third have been broken on the wheel of infirmity, a number agreeing in depressing consistency with the averages adduced in all the other instances cited here.

Why should such appalling numbers of American youth, under standards of living for which so much is claimed, fall at their tender age into the "physically unfit" class?

And here are 1,036,614 men in their very prime, in the very flower of ripening manhood, of whom 42 per cent., nearly half, have been blasted at the core.

In these two classes alone our War Department from a total of 3,604,626 weeds out at a time when stern necessity inspires less rigid physical examination, a full third (1,205,781) and casts them off. Most of these rejected men were ready to die if need be for the land they love, but a loved land has little use in time of war for the mere readiness of her sons. In peace they may decay and still be classified as men, but when the cannon roars it is not readiness, but fitness, that makes a man.

TWO: TWO KINDS OF FOOD: THE CONSTRUCTIVE—THE DESTRUCTIVE

TWO: TWO KINDS OF FOOD: THE CONSTRUCTIVE—THE DESTRUCTIVE

§ 15—MORE PRECIOUS THAN SILVER AND GOLD

The despised minerals of the soil with their mysterious companions, the "vitamines," which are always automatically removed from food when the minerals are removed, control all vegetable and animal life. More precious than silver and gold, these commonplace constituents of food are rejected.

Notwithstanding the formidable names by which they are known, they are found in the commonest of earth that will produce vegetation; in the grasses and seeds of grasses that spring from that earth; in the most familiar living things that feed upon those grasses and their seeds.

As we consume them every day and are not disturbed by their presence or absence in the dining room, we shall have little difficulty in following them in spite of their awe-inspiring names. What we want to know is just how they affect our lives, and how our interference with them results in disease and death.

All the mineral salts work in beautiful co-operation with each other. They teach us that in nature nothing is independent. They reveal the essential interdependence existing among all God's creatures, among even the inert elements that have sprung from His hands.

Without phosphorus, for instance, all the other soil elements are worthless, even though present in abundance.

The science that treats of the life and health of the soil is so conscious of this phenomenon that it has influenced legislation, requiring the fertiliser manufacturer to state in specific terms the exact quantity of the available phosphorus which his commerical product contains.

The soil obtains nitrogen, hydrogen, oxygen and carbon from the air and the rain.

It finds its potassium and other mineral elements through the

erosion of rock, but the quantity of phosphorus in the mines and in the land is so easily estimated and so very limited, because there is no known substitute for it, that man is ever on the alert for a new supply.

The upper crust of the earth, known as soil, averages from six to twelve inches in depth. This thin film of earth containing the vitalising mineral elements that give us all our vegetation is the cradle of the world. It is the dust from which the bodies of men are organised.

The first seven or eight inches of the virgin top soil of an acre of land weigh about 2,000,000 pounds. In this top soil there are only about 2,000 pounds of phosphorus.

Thus we glimpse a little of the wonderful function it performs in combining with the other elements that support and control life. One little part of phosphorus in a thousand parts of earth. Think of it!

Nature's most profound laws are qualitative, not quantitative. Phosphorus, in harmonious activity with all the other mineral salts of the soil, means normal crops, means health, buoyancy and vigour in the animal life that feeds upon those crops.

Absence of phosphorus means soil starvation, loss of vegetable and animal vitality.

Agricultural science knows that this subtle substance must not be removed from the soil if we do not wish the end to come.

All the gold and silver and precious stones of the mines, all the piteous cries of starving multitudes cannot re-create this mysterious compounder of life. So science warns us against our prodigality and tells us that if we wantonly destroy it or remove it from the earth or take it out of our food we must pay the price in disaster. That, nevertheless, is exactly what we do.

Yet we must remember that phosphorus is only one of the mineral elements without which life on the surface of the earth would become extinct.

It is only because the available supply of phosphorus is so small that it possesses picturesque significance as an illustration of the necessity of minerals not only in the land, in the vegetable, fruit and grain which the land yields, but also in the life processes of man and animal.

Iron, potassium, calcium, magnesium, manganese, sulphur, silicon, chlorine, fluorine and iodine are just as important as phosphorus, no more so, no less so.

When we remove any one of them from the earth we produce soil sickness, and the fruits of that soil are correspondingly dwarfed, enfeebled, or do not appear at all.

"Dust thou art and unto dust thou shalt return," is indeed a profound utterance, containing many lessons which the Twentieth Century has been too busy, too materialistic, to heed.

That grim annual parade of 400,000 children under ten years of age, with which the "four-foot graves" of the United States are filled, would not be possible if human intelligence, guided by faith in the benevolent dispensations of God's providence, were to heed for one serious hour, on a nation-wide scale, the gravity of its slothful indifference to the laws of life.

We are now about to see why whole grains, finely ground, containing all the mineral salts and vitamines with which God has endowed them, should replace in our diet not only for their superior flavour, but for what they mean to life and health, the refined, sifted and bolted cereals and breadstuffs upon which we feed; why every ripe fruit that grows should be popularised in the home; why vegetables and greens should receive ten-fold the attention they now enjoy; why the waters in which vegetables are cooked should not be discarded, but rather why they should be served in the form of soups or sauces; why less meat and more milk should be consumed; why all meat should be sterilised and all milk pasteurised; why butter is superior to all other forms of vegetable or animal fats and why it too, as well as ice cream, should be pasteurised; why milk and meat should not be consumed at the same meal, and why young children should not eat meat at all; why meat should always be accompanied by an abundance of vegetables, and why no child or adult should pass a single day without consuming fruit in some form, even though it be but dried fruit such as raisins, dates, figs, prunes, dried apples, apricots or peaches, and why sun-dried fruits should replace the sulphur-dried product of the market place; what eggs mean to the diet, and how to prepare for home use the unrefined grains in all their delicious combinations of whole meal breads, muffins, biscuits, cakes, porridges and puddings

to which they so marvellously lend themselves not only at home, but in the restaurant; why refined sugars such as granulated cane sugar and beet sugar, glucose syrups and candies should be consumed in ever lessening quantities; why the natural sugars such as unsulphured brown sugar, old-fashioned cane syrup, molasses, old-fashioned sorghum, old-fashioned maple syrup and honey should be consumed instead; why baking powders should be sparingly used; why artificial colours, chemical preservatives and chemical adjuncts such as sulphites, alum, saccharine, sodium benzoate and the whole coal tar scheme should be rejected.

Behind this general proposition rests a structure of corporal and spiritual beauty, the form and substance of which although bequeathed to us through the wisdom of Moses, would still have to be accepted on faith, were it not for the revelations of modern science itself.

§ 16—THE INFLUENCE OF EARTH SALTS ON LIFE

Dr. J. Reynolds Green, Cambridge, has demonstrated that even in the life of the plant the mineral salts play many parts, and are necessary for the assimilation of the food of protoplasm.

Protoplasm is the soul and essence, the vital, growth-controlling, life-maintaining material of the vegetable and animal cell.

A new school of scientific experts has juggled with protoplasm, and from it coined the mystifying phrase "vitamines," subordinating, even dismissing, under the one-sided enthusiasm of its erudition, the simpler but none the less indispensable elements without which protoplasm, vitamines, the "fat soluble A," the "water soluble B," or any other component of life-supporting food cannot exist.

The purpose of these words is not to clutter up the mind of the reader with a hodge-podge of scientific terms, but rather to demonstrate the exquisite simplicity of what now, to the plain people, appears to be the most baffling and perplexing of riddles.

Here and there the employment of scientific terms becomes essential. However, we need not be afrighted in their presence, for they are the crutches upon which we shall hobble into ligh

and our journey without them would be slow indeed. So much for that.

Now for the work we have undertaken.

Pfeffer, in his many experiments, demonstrated the importance of mineral salts to the growth of plants which, unlike the animal, have the power of utilising mineral food as it exists in the ground. The plant can make its own vitamines. Man cannot.

We shall make no statements without fortifying them by facts, hence the reference to Pfeffer and others who shall step on our little stage hereafter.

Pfeffer made a solution of water, iron oxide, calcium nitrate, potassium nitrate, magnesium sulphate, potassium acid phosphate and potassium chloride. Into this solution he put buckwheat to grow. He also made other solutions from each of which he omitted one or more of the mineral salts, in order to determine what effect such omission would have upon the development of the plant.

Through these experiments he proved that the plant, deprived of any of the minerals mentioned, is affected at once injuriously. He proved that in the absence of iron the development of chlorophyl does not take place.

Chlorophyl is the green colouring matter of the plant, and corresponds with hemoglobin, the red colouring matter of the blood. Without chlorophyl there can be no vegetable life, as without hemoglobin there can be no animal life. Both depend on iron for their existence.

He proved conclusively that in the absence of iron faulty nutrition is at once set up.

In five glass jars employed by him it was easily seen just how the growth of the plants is affected by depriving them of any of the mineral salts so necessary to their existence.

These food minerals of plants can be divided into four groups, each of which serves a different purpose.

In the first group are found sulphur and phosphorus. All analyses of proteins, the fibre of meat, the albumen of egg, the gluten of wheat, the casein of milk, show that sulphur and phosphorus are essential constituents of them. As proteins are immediately utilised in the construction of protoplasm, it can be

seen that these salts are contained in every living substance.

The second group comprises potassium, magnesium, calcium and iron, all of which have been conclusively demonstrated to be essential to the development of the plant.

The third group consists of sodium, silicon, manganese, chlorine and iodine, without which no plant can grow.

In the fourth group is found fluorine, which performs a wonderful function in all plant and animal life.

In plant life it has been shown that potassium is directly connected with the construction of sugars and starches, but in just what way is not clearly known.

Potassium occurs most frequently in the organs in which the formation and storage of sugars and starches are most actively carried on, such as in the leaves and tubers.

It has been shown that magnesium has a distribution much like that of potassium, and that calcium is essential to the health of all green plants. One of its functions clearly established is its activity in neutralising oxalic acid, a poison elaborated in the nutritional processes of vegetables, and therefore finding its way into animal life.

When we compare the influence of potassium, sodium and calcium on the development and growth of plants we find the presence of potassium leads to the development of stems, flowers and fruits, or to what may be regarded as the maturing of the plant, while in the absence of potassium the growth of the leaves is more directly favoured, the crop remaining backward and immature. The fruit does not develop!

It has also been established that the nitrogen so essential to the life of animal and plant is combined with the mineral salts of the soil in the form of nitric acid.

The minerals are thus taken up from the soil not only for their own sake in the performing of many functions in life's processes, but also for the sake of the nitrogen which they carry to the plant. In other words, they are nitrogen carriers as well as oxygen and carbon carriers.

Oats mature less fully and completely in the absence of silicon, thus establishing evidence of its aid in the metabolism of the plant.

Until quite recently little was known of manganese as a con-

stituent of many plants, but it has now been determined that manganese exerts a powerful influence on various oxidative processes carried out by a somewhat widely spread enzyme known as laccase.

A curious phenomenon connected with these facts stands forth when we consider that many of the food minerals even in moderately dilute solutions are extremely poisonous, yet when nature finishes her mysterious work of manipulating, combining and compounding them, they are not only not poisonous, but actually benevolent in their effect upon plant and animal.

Potassium in its pure state is a deadly poison, yet in its absence the degree of development of the plant is limited.

When the effects of such deficiency are so well marked even in the case of plants, how reckless is man when he permits the food of his children through entirely unnecessary, useless and vainglorious processes to be deprived not only of their potassium salts, but also of every one of the other mineral salts which we are beginning now to see in their true significance! What effect upon the vigour of American childhood and manhood, considered apart from the deaths every year of 400,000 children under ten years of age, is exerted by the removal of these food minerals from our national diet?

We shall see.

§ 17—OLD AT TWENTY-FIVE—YOUNG AT SIXTY

When sufficient potassium is present in the food of the plant its sugars and starches are produced in greater quantities. The plant itself moves on normally to maturing and the formation of its flowers, and subsequently of its seeds, follows without interruption.

The composition of the soil determines largely the character of the development of the plant, exerting a vast influence upon the variety of the species, the different individuals of which are influenced accordingly. The same food influence is seen in operation in the development of the heavy bones of the truck

horse and the fine bones of the race horse, in the development of the queen bee and the worker bee.

Ethnologists who write so dogmatically upon the creation of man, drawing preposterous conclusions from the long heads and long bodies of the Nordics, the round heads and sturdy bodies of the Alpines, and the "disharmonic combinations" of Nordic and Mediterranean mixtures would be less aggressive in their journeys into the blurred and misty past, less sure of their assumptions if they included food in their tortuous speculations.

Their sneering references to Genesis and their contemptuous disposition of Adam, mask, in the name of wisdom, a depth of ignorance which only the highest arts of camouflage can conceal. The composition of the food of man largely determines the character of the development of himself and his children, exercising the same vast influence upon the physical characteristics of his offspring as are exercised by soil food on the plant, and by plant food on the horse.

The ethnologist who laughs at this has never bred, broke nor trained a race horse, nor has he ever heard of the influence of pellagra, a food deficiency disease, upon "the poor white trash" of the South, nor has he ever fed four generations of chickens on meat, but more of this later.

It has been conclusively established that in the absence or through the deficiency of this or that food mineral others may be absorbed in unnatural proportions and combinations. This is one of the most alarming arguments against manipulation of these minerals, whereby some are removed entirely, leaving others in proportions altogether out of harmony with nature's formula.

We do not know in what manner certain minerals are deposited in the arteries, but we do know that the hardening of the arteries, brought about by these deposits, is the chief cause of old age. A man may be old at twenty-five or young at sixty, depending upon the condition of his arteries. Over this phenomenon the ethnologist blindly leaps.

There is much evidence of which the ethnologist has never heard, to support the belief that man's disregard of the meaning and significance of the natural proportions of food minerals

as they are elaborated by Mother Nature is responsible for the abnormal growth of many organs and glands; responsible in a particular manner for the growth of morbid cells found in all tumours and cancers.

Packard's illumination of this subject is destined to shine through the centuries.

We know what happens, for instance, when the thyroid gland is deprived of its iodine, and we know how the enfeebled thyroid affects the rest of the body. Just as a handful of fertile earth, a measure of wheat, a pint of milk, and the flesh of an animal each contain the salts of the earth, so the blood, the gastric juice, the pancreatic juice, the saliva, the bile and all the other internal secretions of the body are composed chiefly of mineral salts in solution.

We need only glance over the following analyses made many years ago, but to-day as true as when they first came from the laboratory, in order to see how these internal secretions contain a constant minimum of these salts.

Analysis of saliva by Frerichs, Berzelius, and Hammerbacher, calculated for 1,000 parts by weight of mineral salts.

	Frerichs	Berzelius	Hammerbacher
Water	994.1	992.9	994.2
Total solids	5.9	7.1	5.8
Minerals	2.19	1.9	2.2
Potassium	457.2	—	—
Sodium	95.9	—	—
Iron oxide	50.11	—	—
Magnesium oxide	1.55	—	—
Sulphur	63.8	—	—
Phosphorus	188.48	—	—
Chlorine	183.52	—	—

Analysis of mineral salts of blood serum by Cavazzani calculated on 100 parts of fluid.

Potassium oxide	0.387
Sodium oxide	4.290
Chlorine	3.565
Calcium oxide	0.155
Magnesium oxide	0.101

Analysis of mineral salts of red corpuscles by C. Schmidt calculated on 100 parts of the moist corpuscles.

Potassium chloride	3.68
Sodium chloride	Traces
Potassium phosphate	2.34
Sodium phosphate	0.63
Calcium phosphate	0.09
Magnesium phosphate	0.06
Iron oxide	0.47
Potassium sulphate	0.13

Analysis of pancreatic fluid calculated on 1,000 parts, by Schmidt and Kruger.

	C. Schmidt	Kruger
Water	900.8	980.44
Solids	99.2	19.60
Mineral salts	8.3	3.57
Sodium chloride	7.35	0.93
Potassium chloride	0.02	0.07
Calcium phosphate	0.41	0.01
Magnesium phosphate	0.12	0.02

Analysis of bile minerals by Jacobsen and Hoppe-Sayler based on 100 parts by weight of salts.

Sodium chloride	65.16
Potassium chloride	3.39
Sodium carbonate	11.16
Trisodium phosphate	15.90
Tricalcium phosphate	4.44
Calcium carbonate	Traces
Potassium sulphate	Traces
Sodium sulphate	Traces
Iron, silica	Traces
Magnesium	Traces

Analysis of gastric juice by C. Schmidt.

	Human	Dog
Water	994.40	973.0
Total solids	5.60	27.0
Mineral salts	2.19	6.7
Sodium chloride	1.45	2.5
Calcium chloride	0.06	0.6
Potassium chloride	0.55	1.1
Magnesium phosphate	—	0.2
Iron	0.12	0.1
Calcium phosphate	—	1.7

In all of these analyses it must be remembered that the chemist, handicapped as he is when working in the organic field, has not determined the form under which, in their highly organised states, the various minerals found in the laboratory previously existed in the internal secretions of the living animal.

In reducing the organic mineral salts and colloids to "ash" their form is completely changed so that all the chemist can say for the result of his analysis is that the minerals are really there, and that they are always there, regardless of the proportions in which they are found by this or that investigator.

We must not assume because the chemist has calculated the iron of the red corpuscles as "iron oxide" that it would be a good thing, therefore, to go to the drug store and purchase a dose of iron oxide. The iron in the blood does not exist in such form. The chemist has to reduce it to such form before he can recover it from the organic compound in which it is found in life.

Herein lies the error made by the patent medicine manufacturer who tries to make the people believe that because certain salts are found in the human body therefore medicines containing them are good for the human body.

To assume that because "calcium oxide" appears in an analysis of blood serum it must therefore appear in the blood serum itself as calcium oxide is a childish error.

The calcium, iron and other mineral salts as they appear in the blood and internal secretions are present in such wonderfully complex forms that they cannot be reproduced in the drug store or laboratory.

The dumb grasses of the field possess the power to organise these salts of the earth into forms in which they can be assimilated by the animal. Man with all his intelligence and all his laboratory apparatus cannot do this, yet man is presumptuous enough to offer excuse, even justification, for his work of juggling, manipulating, refining and destroying them before he sells his finished product to his neighbour.

§ 18—THE HUMAN BODY

The mineral salts present in the internal secretions of the human body are not present through the operation of blind accident. Selective action picks and chooses, accepts and rejects, absorbs and discards them in a manner so astonishingly intricate and so exquisite in its rhythmical waves that those who study the very majesty of these phenomena are compelled to see in them a Supreme Intelligence regulating all their orderly activities.

In the clearly disclosed evidences of that intelligence we behold the workmanship of God.

Water forms about three-fourths of the weight of the adult body, and is the medium in which its biochemic activities are carried on. Even the child knows that without water no plant life could exist.

Plants that have but a single cell, which are not actually immersed in water, are generally found in more or less moist situations where they continually get their supply of water from dew or rain. In times of drought they are seriously injured.

The young cell which is enclosed with a cell membrane speedily shows a tendency to accumulate water in its interior. Gradually traces of water appear until ultimately a vacuole, which is always full of liquid, is formed.

In the plant which consists of a number of cells such a vacuole is found in every adult cell as long as it is living. In other words, healthy protoplasm must always be in direct contact with water. It is only while saturated with water that the active life of protoplasm can continue.

A few "scientists," taken off their guard in public debate, have asserted that the removal of minerals from man's food through refining processes can do no particular harm because the body contains a store of minerals which do not require to be replenished.

The same preposterous argument would indicate that because man's body contains an enormous store of water (three-fourths

his weight) it is not necessary for him to replenish that store daily. More of this later.

We now know that with very rare exceptions if a cell is once completely dried, even at a low temperature, its life is gone, and restoration of water fails to enable it to recover.

The life of a plant is intimately connected with the renewal of the water which its cells contain. Fresh liquid must be constantly taken in, just as a new supply of mineral salts must be taken in. The water which is already there must, to a certain extent, be removed.

The plant depends in fact upon a certain circulation of water, and this becomes the more imperative as its growth increases.

It has been proved that protoplasm, which, as we have seen, is the active substance found in every living cell of plant or animal, draws its nutriment eventually from the salt solutions which come to it.

It has also been established that protoplasm in plant and animal must return to these solutions such waste products as it gives off. It must obtain its oxygen for instance from water, for this element can only pass into the interior of a cell through the liquid which enters that cell.

Thus we see that water is a wonderful medium through which the forces of life are conveyed. It is not difficult to believe, therefore, that the body of a man weighing 160 pounds contains more than 100 pounds of water, not as the result of accident, but as the result of a fixed law.

Of the solid matter found in the human body about one-fifth is made up of the minerals—iron, calcium, phosphorus, potassium, magnesium, manganese, sodium, sulphur, silicon, fluorine, iodine and chlorine.

Chlorides and phosphates with carbonates and sulphates form the chief of these mineral salts as far as weight is concerned, but some of the salts which appear in mere traces, such as fluorine and iodine, have essential functions to perform, and without them we now know that human life as it now exists would not be possible.

One of humanity's most conspicuous sins of omission has been its failure to consider reverently the dignity and the complexity of the human body, which, considered apart from the

human soul, is the most majestic work of creation. Let us examine a single detail of its marvellous composition.

If we place a trace of fresh blood under the microscope an astonishing picture is presented to the eye. Hundreds of little corpuscles are seen floating about in the blood serum; most of them are red, but a considerable number are white.

A single drop of blood contains so many millions of corpuscles, far more than all the visible stars in the sky, that less than a hundreth part of a drop, the merest trace, must be used on the field under the lens in order that the eye may see anything at all.

These red and white corpuscles are in themselves alone sufficient to confound all the wisdom of the universities, but they are not the only substances discoverable in that fragment of a drop of blood.

Moving about with them as part of their structure, or in the fluid in which they circulate, we find, as we have seen, the salts of iron, calcium, phosphorus, sodium, potassium, magnesium, manganese, sulphur, chlorine and many other compounds which we shall not consider here.

These substances are always found when pure and normal blood is examined. It is evident they must find their way through some definite channel, and in obedience to some well-defined law.

It has been established on many occasions that the red and white corpuscles each have certain well-defined work to do. It has also been established that any foreign agency that interferes with their work or keeps them from getting into the blood is an enemy of life.

In order to compound that marvellously complex solution which we call blood, Mother Nature obtains her building materials from food, just as she obtains food from earth. Let us emphasise this impalpable and imponderable truth over and over again. We can never attach to it too great or too sublime an importance.

The whole character of the blood depends upon the character of the food supplied to the digestive organs.

What kind of blood is supplied to the 400,000 children under ten years of age who die every year in the United States?

What kind of blood was supplied to the "rejects" of the army of 1918?

What kind of food is supplied to both? We shall soon know.

§ 19—BREAKING IT DOWN

The food-minerals and vitamines upon which life depends must be in the food man eats, that his body may take them from that food.

All food contains them until man removes them. Consumed for a few months, food deficient in some of these building materials gradually affects health.

If we are partial to a particular food from which a considerable portion of nature's building materials has been abstracted, disorder is bound to develop.

Nature, handicapped by the deficiency, will set up warning before fatal damage has been done, but if we do not understand her warning, or if we disregard it, we head straight for destruction, unless in the meantime an accidental change of diet provides the offsetting substances essential to life.

Accident and chance are the elusive forces that temporarily bar the doors against destruction.

With the army of the dead, augmented in the United States every year by 400,000 children under ten years of age, no happy accident ever interfered.

Surely man should make an effort to locate the law upon which so much physical integrity depends.

Each drop of blood is but an expression of that law. Anything that interferes with the purity of blood is hostile to life. "The blood is the life."

Because man leaves so much to chance he sends a call into darkness, summoning hundreds of diseases to assist him in mismanaging the world in its sad sum total of misery and pain.

The removal of one substance essential to life marks the beginning of disorder in the body. If two substances are removed the body may make use of the others until the handicap asserts itself. Then confusion must ensue.

If three, four or five substances are removed the inevitable collapse will take place a little sooner.

If seven or eight substances are removed destruction gallops to the end. When all sixteen substances and their compounds are removed starvation itself begins.

If we believe that God has elaborated these substances for our benefit it is little short of sacrilege to disregard them, or to trifle with them, because by doing so we assert our independence of His designs.

If God is rejected entirely from the scheme of the universe the extraordinary phenomena which spring from food, nutrition, health and life must sooner or later overpower the spirit. In the presence of miracles of life, too profound to be comprehended by the human intellect, the knee must bend.

But whether man be a fervent believer or a scoffing atheist, he must see that breakfast, dinner and supper are not matters to be left to accident or the designs of a food factory concerned chiefly in the profit of its products.

If he is pale or anemic, if his energy is quickly exhausted, if he feels "all run down" and little like undertaking the commonplace duties of the day, if his children have lustreless eyes, pallid complexions, undeveloped bodies or manifest abnormal tendencies, let him look to his food.

If they are bright, sturdy and resist illness, which he wrongfully and cruelly assumes must come to all children, let him congratulate himself that an accident has brought them immunity.

In congratulating himself let him not ignore the truth. An apple falls from the tree in obedience to a fixed law. If his children are in health to-day as the result of another fixed law, concerning which he knows nothing, let him know that they may be protected to-morrow.

Our sixteen food minerals and the vitamines associated with them are no part of chance. They are the law.

The body derives them, and the resistance they bestow, from food and from no other source. To take them from his food man must find them there. He cannot find them in food from which they have been removed. With their loss he loses his resistance.

If God had not endowed man with this extraordinary resis-

tance, the human family would have to keep itself hermetically sealed in tin cans or glass jars.

The salmon is canned because dead flesh offers no resistance to germs. A tin shell acts as a substitute in keeping the germs off. Open the can and let them in for twelve hours. The results will speak even in that short time. Let them in for twelve days and the neighbours will retreat. Keep them out and the salmon will stay sweet for a century.

There is nothing quite so marvellous as the power of healthy living tissue to hold germ life in contempt. It is quite as effective as a hermetically sealed can. Death and putrefaction are synonymous.

Putrefaction simply means the splitting up of tissue compounds into their simple elements. Bacteria are the instruments employed by nature to get rid of the dead. Without germs nothing would rot. When a body is embalmed the germs are simply held back a little while.

Bacteria convert dead flesh into gases and dust. On healthy living flesh they have no effect. On living flesh that has lost its resistance they feed even in life, but they do not convert such flesh into gas and dust. They convert it into poison.

One kind of germ poison produces typhoid, another diphtheria, a third syphilis, a fourth pneumonia, a fifth tuberculosis.

Some germs, invited deliberately into the living temple, are not included in God's plan of protecting humanity from their assaults, and the body, even when healthy, offers feeble resistance to them.

The result is disease, loathsome and unnatural, involving not only the bones, nerves, blood and brain, but even the soul. The flesh disintegrates and reason itself totters as the germ of syphilis cavorts across the human highway in its dance of death.

But—with respect to the many germs that have their own proper functions to perform outside the body, and which therefore in their wide distribution through nature are taken into the system almost hourly through food, drink and air, the living flesh in health laughs at them all.

They may approach in battalions only to be overcome as rapidly as they advance, whereas a solitary organism entering life through the channels of vice becomes venomous, malignant,

powerful. After taking up its residence in the blood it begins a blighting reign so imperious and dominating that its evil influence passes on to innocent children yet unborn as if to emphasise the truth of the prophecy, "The sins of the father shall be visited upon his children even unto the fourth generation."

Potent poisons such as arsenic, mercury and the iodides may retard for a while the catastrophic activity of these avenging organisms, but there is no evidence to prove that even when these "curatives" are most skilfully administered the forces of degeneration are not passed on in some measure from generation to generation in accordance with the formula laid down in the scriptures.

Man, surrounded by the artificial protection of modern medicine, defies, or thinks he defies, the inexorable laws of nature, but ever is he confronted by disclosures that above him and beyond him in unseen realms which only the microscope may feebly penetrate, are powers so small the naked eye has never beheld them, but which in irresistible energy are mightier in the number of their victims than earthquake, fire and flood.

Contemplating this Nemesis of evil, man is consoled by the knowledge that it is within his lot to regulate his conduct in the flesh so that without the aid of art or science he may rely with sublime confidence upon other forces as benign as they are beautiful.

Because he is a free agent he may choose for himself between good and evil, knowing that even germs are divided into good and bad and that most of them are good. Well may he doubt the conclusions of his own arrogance in dismissing the ancient doctrine concerning good and evil spirits.

The folly of rejecting what he cannot see or understand is nowhere more visible than in his attitude toward those purely material forces of life and death which, prior to fifty years ago, were neither seen nor understood by mortal, but which now exhibit themselves to reverent eyes in grandure that moves to awe.

What the ubiquitous tin can, hermetically sealed under the laws of sterilisation, is to salmon, natural resistance, safeguarded by well-disposed intelligence, under the natural law, is to man and his children.

Why does he persist in his refusal to see the beauty, the benevolence and the consolation of this parallel?

§ 20—SUBTLE ACTIVITY OF MINERAL SALTS

This little experiment can be performed in the laboratory of any high school to help us grasp an idea of the remarkable conduct of the minerals in the human body.

First eat a tablet of citrate of lithium. Then take a clean platinum wire. Hold the wire in a blue Bunsen flame. It will give no colouration to the flame.

Now pass the platinum wire along the skin of the forehead or across the palm; return it to the flame and note the beautiful yellow fire of sodium, showing this mineral at work in the elimination processes of the body.

Without sodium to take up the carbonic acid, evolved through the digestion of sugars and starches, as a poisonous waste product that must be removed from the body, this acid, better known as carbon dioxide, would accumulate in the tissues and destroy them. This is why the excessive use of denatured sugars, table syrups, and starches in the diet of America is followed by many serious diseases.

Sodium is one of the food minerals indispensable to health. The little platinum wire and the Bunsen flame reveal it in the performance of one of its many functions.

Now take a blue glass, which will filter out some of the light rays that interfere with vision. Look through it at the platinum wire in the flame. Note the beautiful lilac flame of potassium, showing this mineral also in the elimination processes of the body. The sodium and potassium have been taken up from the human skin.

Potassium helps to keep the tissues flexible and active while assisting the sodium to carry off the carbonic acid manufactured as one of the end-products of combustion in the furnaces of life.

We shall assume now that a half hour has elapsed since the tablet of citrate of lithium was consumed.

Again clean the platinum wire thoroughly. Pass it over the forehead or across the palm of the hand. Place it in the flame. It is coloured a vivid red. This is the flame of lithium. In one short half hour the lithium, taken through the mouth, has circulated through all the avenues, highways, and by-ways of the human body and has appeared after its marvellous journey upon the surface of the skin.

Through this simple experiment we obtain a crude idea of some of the hidden forces at work in our bodies.

There is much evidence that potassium gives life to the nervous system and assists the heart to beat by influencing the relaxability of the heart muscles. If the heart did not send the blood into the lungs the body could not and would not obtain the oxygen necessary to its life, nor could it, through those delicate tissues, made up of millions of little valves or filters, dispose of the waste gases which would otherwise poison all its organs and glands.

Many discoveries of science justify the conclusion that potassium interferes with the hardening influences that menace muscle, joint, and artery, making the tissues soft and pliable.

It has been noted that linen, made from flax grown on granite soil, rich in potassium, is noted for its suppleness and softness, whereas linen produced from flax grown on calcareous soil is hard, brittle, and of little strength.

In the month of October, 1915, potassium sulphate was worth about $200 a ton, as produced from alunite by the United States Smelting Company of Utah. At this price the Armour Fertiliser Company purchased its entire year's potash production. In spite of the value of potassium salts and the necessity of their presence in fertiliser, 106 tons of potassium salts were wasted daily in 1915 by the twenty-five distilleries in the United States that subjected molasses to fermentation.

The farmer has been taught, through various federal and state bulletins, to appreciate the necessity of potassium to the health and vigour of his plants, yet school children have never been taught that when the body cannot secure the quantity necessary to carry on its wonderfully complex duties the heart ceases to serve its master and the body dies.

§ 21—CONSTRUCTION WITHIN; DESTRUCTION WITHOUT

Those little soldiers of life called corpuscles are never out of the presence of iron. Containing no iron themselves, they nevertheless swim about in a fluid which does contain iron. If that iron were not present the little soldiers would die.

Iron combines with oxygen in the presence of water, no matter where it is found. The blade of a pocketknife, the hinge of a barn door, the barrel of a rifle, the spring of a farm wagon, become "rusty." Rust is simply a combination of iron and oxygen. The chemist calls it "ferrous oxide."

The wonderful affinity of oxygen for iron is an expression of the law under whose operation oxygen finds its way into the body. Without the iron in the red colouring matter of the blood the body could not appropriate the oxygen from the surrounding air and in a few minutes it would perish.

We need only choke a human creature two minutes to be guilty of murder. To choke means to shut off oxygen. The carburetor of an automobile engine is equipped with a "choker." To stall the engine it is only necessary to resort to this choker, which, by cutting off the oxygen, makes combustion in the cylinders impossible.

In exactly the same way combustion, supported by oxygen, is necessary to the fires of life.

If the blood contains only half the iron necessary to bring into the body the oxygen it requires it will grow pale and sicken. Iron is indispensable. It is part of the law.

The waste matter accumulating in the human tissues during every second of existence would destroy life in twenty-four hours if not rendered harmless and carried off. When these waste products are only partially removed the result is autointoxication, self-poisoning.

The iron in the blood, uniting in the lungs with the oxygen of the air, carries its life-supporting freight to the tissues, where it oxidises or burns up the waste substances so dangerous to life.

If the iron is not present in sufficient quantity to keep up with the demand of the body the oxygen that ought to be inside performing its work remains outside ready and willing but unable to enter.

When fire, through the influence of oxygen, attacks a piece of wood it produces smoke and ashes. Just as the smoke of the fire has to be carried off through the chimney and the ashes raked through the bars of the grate, so do the oxygen-burned waste products of the body have to be eliminated.

This oxidising process going on in the human tissues produces the carbonic gas which we have seen taken up by the sodium in the blood and discharged through the lungs as carbon dioxide.

The sodium, having work of its own to perform, has to help the oxygen and the oxygen in turn has to be helped by the iron. Thus we obtain a vague idea of how these food minerals and the other elements necessary to the support of life operate, not singly and alone, but in beautiful harmony with each other, in unswerving obedience to a fixed law.

Calcium, commonly known as lime, combines with phosphorus, magnesium, silicon, and fluorine in the development of the bones and teeth. If the quantity of calcium required by the body in the construction of its bones and teeth is reduced the bones and teeth suffer.

We have seen that millions of children in the United States are suffering with defective teeth. These defective teeth are the direct result of the inability of the body to obtain, in their proper form and in their proper combination, the calcium, magnesium, phosphorus, and fluorine necessary to the construction of normal teeth, either because these mineral substances have been removed from the food of the children or because they have been consumed with other foods that destroy them and remove them from the body.

Chickens obtain the fluorine required for the production of their eggs, if they have a chance to pick up a few specks of granite. When confined in a wooden henhouse and fed on food containing no fluorine they easily develop chicken cholera and chicken diphtheria.

The yolk of the egg requires fluorine. The protective enamel

of the teeth requires fluorine. The bones of the spine require fluorine. The pupils of the eye require fluorine.

Silicon possesses powerful antiseptic properties. There is good reason to believe that in the establishment of normal resistance to disease it assists the body to defend itself against the invasion of many of the organisms which cause disease.

Silicon influences the nervous system to perform its functions normally. In combination with sulphur it is necessary to the development and health of the hair and nails. Bears, bison, foxes, sheep, have luxuriant hair, fur, or wool. There are no bald or thin-haired squirrels. They consume all the silicon nature provides for them. Their hair food and nail food are normal.

Animals fed upon food from which any of the food minerals are artificially removed perish.

Experiments on animals in captivity have proved this. White mice, rabbits, guineapigs, hogs, and poultry develop the same diseases as those which kill 400,000 children under ten years of age in the United States every year, when these animals are fed on the same foods so freely consumed by children.

Food minerals not only themselves engage in the construction processes going on constantly within the body but they also exercise a controlling influence over the destructive forces that threaten the body from without.

We are now beginning to appreciate the fact that food minerals are precious substances. Yet not a single one of the states prevents the adulteration of food through the abstraction or removal of them.

§ 22—FOOD MINERALS ESSENTIAL TO LIFE

The smallest boy in the laboratory can be made to understand the wonderful oxidising property of sulphuric acid. When this acid is generated in the human body, as it is generated every day, it is immediately neutralised by the alkaline bases which nature, under normal conditions, never fails to provide for that purpose.

Phosphoric acid is also generated in the body and neutralised in the same manner. Calcium, magnesium, and potassium are among the alkaline bases provided by natural foods. If they are not present to do their work within a short time the destructive action of the sulphuric and phosphoric acids can end only in disaster.

A few drops of sulphuric acid taken into the body from a bottle will produce death, by attacking the tissues, oxidising and destroying them.

When food from which the minerals have been removed by commercial processes or by foolish methods of cookery is introduced into the body, it results in the formation of free sulphuric acid from the albumenoid sulphur and of free phosphoric acid from the many complex phosphorus compounds found normally in meat, cheese, eggs and other articles of diet.

These acids, in the absence of the alkaline bases that ought to be present, and which in normal, natural foods always are present, must be neutralised as rapidly as they are evolved. It is because they are neutralised that we find them in the urine as discarded waste products in the form of sulphates and phosphates.

When the neutralising bases have been removed from food before it is consumed these acids abstract basic elements from the living tissues, thereby impairing or destroying them.

Meat which is minced and immersed for a few hours in distilled water loses its potassium, magnesium, and calcium salts. It also loses its colour. If cooked in this condition it will be found to be tasteless. If fed to dogs and cats or other animals these animals will eat a little, then refuse to take more, and if fed on nothing else will actually die more quickly than animals not fed at all.

This can be accounted for not only through the generation of free sulphuric and phosphoric acids in the bodies of the animals but also by another fact.

The animals fed on the demineralised meat, in addition to being deprived of the food minerals indispensable to life's processes, are also obliged to dissipate their reserve vitality at a rapid rate through the efforts of their organs to throw off the useless and dangerous food elements imposed upon them; whereas the

animal starved outright is not called upon to expend its strength faster than the laws of starvation demand.

One feature of the laws of nutrition we are endeavouring to emphasize, is that these food minerals are so essential to the life and health of the body that when the body is deprived of them disease must follow.

Certain experts have gone so far as to declare that all human food contains an excess of mineral salts.

Where natural foods are considered the statement made by these experts is never true. On the contrary, it has been conclusively proved in many instances, particularly where refined foods are consumed, mineral salts are carried out of the body in life's processes faster than they are taken in.

This is notably the case in tuberculosis and wasting diseases, in which the calcium content of the feces invariably exceeds the calcium content of the food consumed. It was the case among thousands of the children who, under the age of ten years, died last year in the United States.

Nature does provide a reserve from which, in emergencies, for a short time, the body may find the elements it requires. But if the diet is of such a refined character that it exhausts nature's storehouse, destructive consequences inevitably follow.

This fact must be remembered in the feeding of children, because when the food of the infant is changed from a purely milk diet to a mixed diet great injury may result from a deficiency of lime and other salts. This injury manifests itself on the surface in the form of defective teeth, but defective teeth constitute only a symptom of much deeper ravages within.

An exclusive flesh diet is poor in lime and many foods on which children are fed have as much as 75 per cent. of the lime natural to them removed before they are put upon the table. This is one of the reasons why the excessive consumption of meat is a curse. Meat is deficient in the mineral salts required by the body unless consumed as the tiger and the leopard consume it, lapping up the blood and gnawing the bones.

In consequence, the excessive meat-eater is plagued with rheumatism, asthma, and many other diseases in the alleviation of which he is sent to the mineral springs to drink water containing calcium, magnesium, and sodium sulphate.

These waters, however large the quantity in which they may be consumed, are useless unless the offending diet is first corrected, the peg removed.

In its proper place, baby's diet, based on the importance of its mineral contents, will be carefully outlined and of even greater importance and significance the diet of baby's mother before baby is born will receive the same attention.

§ 23—THE THYROID GLAND, A POISON DESTROYER

We shall now consider one more instance of the subtle relationship between the food minerals and the health of the body. There are glands in the neck called the thyroids, the importance of which, in the economy of life's processes, was never suspected until Breisacher, Plum, Kishi, and Bryce made it clear that the thyroids, like every other organ or gland of the human body, were really created by God for a special purpose.

Sometimes when the thyroid becomes diseased it attains an abnormal size, swelling out in the form of a great lump (goitre). At other times when even more seriously diseased its enlargement may be almost unnoticeable, except to the touch.

It has been conclusively established that in its proper functioning the thyroid depends upon the compounds of food iodine.

We have seen how the food minerals help to build up the body. We have also seen how they help to tear down the tissues. In the processes of assimilation and elimination they are equally important.

In this work of elimination the food mineral iodine and the thyroid gland, which iodine affects profoundly, are actively engaged, thus helping to rid the body of many of its enemies and defending it against the assault of disease.

Alexander Bryce proved that the intestinal decomposition of meat produces poisonous products of putrefaction which are absorbed by the walls of the bowel and which, having thus entered the system, become powerful irritants. They thus produce an increase in the connective tissues of the organs and blood

vessels, hardening of the arteries, senile decay, tumours, and cancers.

Metchnikoff suggested that to aid the body in its effort to protect itself against these poisonous products nature has provided poison-destroying organs, among which is the thyroid gland.

Breisacher proved the poisonous products of meat digestion will quickly kill a dog if the thyroid gland is removed, although after its removal the life of the animal can be indefinitely prolonged if fed on bread and milk.

His experiment established the function of the thyroid as a poison destroyer.

Both Plum and Kishi were brought to the conviction after a series of experiments that the function of the thyroid gland is to neutralise the poisons derived from the putrefaction of albumen in the intestines.

An exclusive diet of eggs causes a condition among children which their parents term "biliousness." This so-called "biliousness" is simply the result of self-poisoning through the imperfect elimination of the protein poison.

In children some glands do not develop until their twelfth, thirteenth, or fourteenth year. The thyroid gland does not begin to develop until the third or fourth year of life. Hence the child lacks its assistance in taking care of these poisons and eliminating them from the system.

For this reason beef extracts, which contain alkaloids that no infant or invalid should be permitted to swallow, become dangerous food.

People in feeble health, put on a beef tea diet, are frequently made worse because of the imperfect functioning of the thyroid and other glands. These alkaloids stimulate and bring about a state of functional excitement. Functional excitement does not mean invigouration.

Neither beef nor beef extract contains the merest trace of iodine, yet the thyroid depends for its activity upon the presence of iodine compounds abstracted from food.

It has been further established that animals, during the period when they feed on fresh grasses and the seeds of grasses, in

accordance with the dictates of the Book of Genesis, have much more active thyroid glands.

The Chicago packers have taken advantage of this phenomenon to manufacture the thyroid extracts advertised in the medical journals.

The investigations of Seidell and Fenger on animals shipped to the Union Stockyards, in Chicago, from all parts of the United States led to a surprising discovery. It was shown by these experimenters that the percentage of iodine found in the healthy thyroid glands of sheep and hogs was about three times as much between June and November, when the animals were allowed to feed naturally on green pasture, as that found between December and May, when they were fed on impoverished commercial by-product foods.

It was also curiously noted that the thyroid glands became larger during the months in which their low iodine content was observed, indicating some relationship between the iodine and the swelling of the glands.

What effect had the removal of the iodine from the food of the 1,500,000 children under ten years of age who have died in the United States during the last four years upon the health of those children prior to their deaths?

§ 24—COMMERCIALISM DISARMS NATURE

Babies and small children are handicapped if their parents or nurses ignore the meaning of the thyroid gland. Animals cannot live without the thyroid under certain conditions, yet one of the elements necessary to the normal, healthy thyroid is deliberately removed from the diet every day.

The grains of the field, barley, rice, wheat, corn and rye, contain normal traces of iodine before they are refined, but there is not a chemist in the country who can discover a trace of this indispensable food mineral in a ton of refined white bread, biscuits, crackers, cakes, table syrups, cornstarch, tapioca, glucose, or sugar candy or in any of the other denatured foods upon

which man is now striving to sustain a normal body under dreadful handicaps.

The thyroid gland is a protecting policeman on guard in the human body. The young child eating food unnatural to its requirements possesses no such police protection. It lives in a state of physiological anarchy. Excess meat in the diet affects not only the thyroid but the liver as well.

In the ingenious experiment conducted by Eck a ligature was applied to the portal vein close to the liver, thus cutting out the liver from the portal circuit of a dog. It was found that a dog thus treated died in three days when fed upon meat, whereas another when fed upon bread and milk lived in excellent health for an indefinite length of time, notwithstanding the cutting off of its liver functions.

Pavlov showed that the liver has three times as much work to do on a meat diet as on a meatless diet.

According to Bryce, flesh foods, at the time they are consumed, contain on an average of 200,000,000 putrefactive bacteria in every gram. But he shows that nature has not left us to the tender mercies of these poison-producers. This is proved by the fact that auto-intoxication does not disturb people in normal health, all of whose organs and glands, including the thyroid, either by good fortune or by the exercise of intelligent discretion are normally nourished, thereby enabling them to carry on their functioning.

The people of America are consuming more meat than any other nation of the world and whether they know it or not they are consuming meat and meat products that have entered into advanced stages of putrefaction.

Frequently they attribute cases of ptomaine poisoning to canned tomatoes, condensed milk, huckleberry pie, cheese sandwiches, and other foods. The real truth is never suspected.

In twenty-six months I was able to obtain forty-seven convictions in the courts against meat packers, sausage manufacturers, and wholesale provision merchants for selling deodorised rotten meats and meat products, chemically treated, so as to disguise from the unsuspecting purchaser their true condition.

I have also obtained the removal from office of veterinarians and inspectors in the employ of health departments and of the

Bureau of Animal Industry for the assistance given by them to influential but conscienceless food panderers who have not heeded these laws of life in their pursuit of dollars.

The details of these convictions are a matter of court record. In the meantime, even when meat is honest, fresh, wholesome, and cut from carcasses of animals free from infectious and contagious diseases at the time of slaughter, it requires normal organs to dispose of it properly.

These normal organs require the elements found in natural food to keep them normal. Modern commercialism helps to put putrefactive products into the human body and then by refining food takes away many of the tools with which nature fights these putrefactions.

The thyroid gland, through the many serious diseases which follow a disturbance of its functions, helps to emphasise the necessity in the diet of every individual, adult or child, of the food minerals which are squandered by modern civilisation with reckless abandon.

Spring time is the season of high spirits in nature. Man alone in the spring complains of lassitude. All around him under the action of nature's unmolested law he witnesses the miracle of rising sap, the quickening strength that swells the bud, the impelling energy that forces the spear of grass to lift itself upward through the lately frozen clod.

Man contrasts his weariness with the power and mastery, the sparkle and glow, the warmth and buoyancy of spring, yet just as the earth has the green grass in its depths so has he the freshness of nature in his heart. He is just as much a part of nature; nature's law grips him just as tightly in its grasp. He needs his "tonic," or thinks he does, because he does not follow the laws of life, but closes his eyes upon them and sets up standards of his own. Unhappily his standards are at war with heaven, and so he pays his price in death.

The time has come when we must teach the child that if he wishes to live and grow strong and be useful he must eat the food God has made necessary to the growth of his body. We shall soon learn how to select that food.

§ 25—WONDERS OF PLANT AND ANIMAL LIFE

In the bodies of animals and plants the twelve food minerals are built up into many highly complex combinations, and as they are being built up they are also being broken down. In disease they break down faster than in health.

As the tissue is destroyed by daily wear and tear it is transformed into simpler chemical compounds and passed out of the body. In order that the living body may replace its broken down cells it must find a constant new supply of the elements from which those cells are evolved.

These elements, as we find them in the soil, can be called non-living matter. The chemical processes which transform this non-living matter into living tissues are the same in plant and animal with this one difference:

Plants are capable of taking the non-living matter from the earth, compounding or organizing it into the wonderfully complex substances which form their structure.

Animals do not possess this power. Animals depend for their existence upon foodstuffs prepared from the non-living matter of earth by the plants that have the power to prepare them. Otherwise man could eat earth, stone, or clay and thus obtain all the elements necessary to his existence. We have seen why he cannot do this.

Plants obtain the energy which enables them to perform their mysterious work of organising the non-living matter of earth from the sun. Only in the presence of sunlight can they carry on the upbuilding processes which give them their tissues. Green grass will not grow in the dark.

We know under the influence of sunlight plants are capable of combining the carbonic gas and nitrogen of the air with water and the mineral salts of the soil into such substances as starch, fat, and albumen. They always do this in the presence of the food minerals.

Their ability to bring about these changes depends upon the presence of a chemical substance found in their green part which is called chlorophyl. We know that chlorophyl requires exposure

to the sun's rays in order that it may be able to perform its serious work, but of the processes by which it does that work we know little.

We know various parts of the plant and various organs of the body contain substances that can be extracted. These substances are called enzymes or ferments or vitamines. Some of them are pepsin, trypsin, ptyalin. There are many others which need not be mentioned here.

These ferments and vitamines are found in the germ and bran of grains, in the marrow of bones, in egg yolk, in leaves, fruit juices, whole milk and greens, and are just as indispensable to the health of the body as the food minerals.

We now know positively that in the human body they serve the purpose of changing the various foodstuffs which are furnished to the animal by the plant into substances that can be absorbed and built up into animal tissues.

Ordinary bakers' yeast is a ferment having the power to transform starch and sugar into alcohol and carbonic gas. It possesses the power to rearrange the molecular composition of sugar and starch.

It is a strange but interesting fact that formaldehyde and wood alcohol, which are deadly poisons, contain exactly the same elements as those which make up the composition of grain alcohol, and acetic acid, whiskey, and vinegar.

Starch, cane sugar, glucose, lactic acid, and carbolic acid also contain the same elements exactly—carbon, hydrogen, and oxygen. The only difference among them is in proportion and arrangement. It is this arrangement which makes some of them beneficial foods and some of them deadly poisons.

Ordinary starch can be converted into sugar by the action of ferments. Sugar can then be converted by the action of other ferments into lactic acid, alcohol, and acetic acid, depending entirely upon the character of the ferment employed.

In other words, there are good and bad ferments. That we sometimes allow the bad ferments to develop and kill off the good ones with so-called "harmless" preservatives will be shown as we proceed.

It was thought at one time that the ferments found in the

digestive glands were the only ferments to be found in the animal body. Accordingly our knowledge of their conduct in the processes of digestion was limited and in the treatment of many diseases the symptoms alone were treated for the reason that the cause was never suspected.

It has been determined in recent years that ferments are of many kinds, are present in every cell and are intimately concerned in all the manifestations of life.

As many as a dozen different ferments have been found, for example, in the liver cells.

It has also been demonstrated that for the maintenance of life in the case of the higher plants the organised ferments are of profound importance. Through them the higher plants obtain their nitrogen from the air in a form which they can utilise.

So it is seen that even in the presence of all the necessary food minerals, if the ferments be absent or destroyed or decomposed, vegetable or animal life cannot be normal.

Each of these ferments has a special function to perform. In the animal body, for instance, some of them, such as pepsin, can act to advantage only under acid condition. Others, such as ptyalin, require an alkaline condition. Still others can act under acid, alkaline, or neutral conditions. Fixed laws control them.

Certain ferments will act only upon certain definite substances and under the proper conditions.

Fat-splitting ferments, for instance, act only upon lard, butter, cream, oil; diastase ferments act only upon starch and sugar; proteolytic ferments act only upon albumen.

Of their chemical composition little is known that is definite and just as little is known of the equally important vitamines. We do know, however, that food of the wrong kind, food badly prepared, food which has suffered an unnatural loss of some of its elements, can set up conditions hostile to the action of these ferments, and that in setting up these conditions we invite physiological discord, disease.

§ 26—THE "ASH" OF FOOD

We know that human gastric juice is acid in action, that it contains sodium, calcium, potassium, magnesium, phosphorus, iron, and chlorine, and depends upon these elements for its physiological activities.

We know if we remove any of these elements or change any of them or prevent the body from finding any of them, by removing them from our food, we thereby establish unnatural conditions in the gastric juice and inevitably bring about disorder.

We know that pancreatic juice, unlike gastric juice, is alkaline in action and contains sodium, potassium, phosphorus, magnesium, and lime.

From this fact we learn that one part of the digestion is carried on in an acid medium while another part is carried on in an alkaline medium, and our conception of the intricacies of the human laboratory increases in admiration and amazement.

In our continued contemplation of these mysteries it becomes more and more evident that man has no right to ignore the wonderfully complicated structure of the human body when he decides to go into business and manufacture for profit the hundred foodless foods which have become so popular on the breakfast, dinner, and supper tables of unsuspecting Americans.

The enzymes, ferments, and vitamines exert such a profound influence upon digestion and assimilation that we receive a shock when we learn that in the preparation of many of our most commonplace foods we destroy them or so completely change their nature that the functions which they are expected to perform are so modified as to make them useless.

The mineral salts that we have described; the ferments, enzymes, and vitamines—let us put it bluntly—are removed from our daily food by commercial practices that pander to false taste standards. The industries that remove them have succeeded, to some extent at least, in establishing high-sounding justification for their work and up to this stage of the world's enlightenment have been equal to the task of fogging the atmo-

sphere sufficiently to cloud any attempted work of reform under the darkness of controversy.

Chemists and pathologists are found willing to go on record with some such statements as these: "Of the metabolism of foods, of chemical change, of the exact action of enzymes and bacteria, we are profoundly ignorant, therefore we should not give consideration to the mineral contents of our diet.

"We derive so many minerals from so many articles of food that we can afford to remove most of them from our diet; and, furthermore, so little is known about the conduct of these minerals when ingested with food that the subject is at least not important enough to occasion grave alarm.

"There are so many offsetting foods which completely replace the mineral salts and vitamines lost through commercial methods of food refinement that we need not worry about the presence of these substances in our food supply."

Signed statements and magazine articles appearing regularly in the magazines of uplift, the purpose of which is everlastingly to quiet natural anxieties concerning commercial foodstuffs, in spite of the death of 400,000 children under ten years of age in the United States every year, constitute the defence of those whose food industries would suffer if the people enacted state and national laws that would forbid them to denature their food supply.

For reasons of their own these men tell us we have sufficient carbohydrates, proteins, and fats (bread, meat, and butter), so we need not bother about the minerals or ferments of our food.

Yet they admit they know nothing about the food minerals. Prior to 1912 the only thing the public ever heard of in connection with a description of food was the academic division made by dietitians. This division consisted of three groups—carbohydrates, proteins, and fats. There was another division to which some of them, on rare occasions, slurringly referred. They called this fourth division "ash."

The division of ash was always exasperatingly ignored and apparently had little if any meaning for dietitians and was not considered by them as significant or important.

As it began to dawn upon various investigators working at different places in Europe and America that a diet of pure carbohy-

drates, pure proteins, and pure fats would not support life, the subject of "ash" grew more formidable and more fascinating.

Physicians and chemists everywhere admitted that personally they knew nothing about ash in relationship to food and did not know where to obtain information.

It is the ash of food that contains the mineral salts of that food. When the mineral salts are removed they take the vitamines with them.

Tons of ashless food, denatured food, demineralised food, debased, impoverished, foodless food, were consumed along with good and adequate food by the 400,000 children under ten years of age who died in the United States last year.

How many of them would be alive and well to-day if none of their foods had been denatured, if all of it had been good and adequate? That is the question we must answer here.

§ 27—CALCIUM IN THE LIVING BODY

The history of life on this earth, including the history of micro-organisms, or germs, as they are popularly called, is the history of food.

As the bodies of men are built from the building materials found in food, so the bodies of bacteria are also built from the building materials found in their food.

Bacteria may become violently active, or feeble to the point of exhaustion, in accordance with the kind of food offered them. Man is affected by his food in the same way.

The blushing maiden of sixteen and the trained athlete of thirty are physically but the sum-total of the food they have assimilated.

The old man, normally approaching the hour of dissolution, represents all that is left of the processes of assimilation and elimination which, even prior to birth, were carried on only by virtue of the food energies presented to the embryo from which he came.

The new-born babe, in all the pink freshness of its little sleepy

life, represents only that fragment of the food appropriated by its bones and tissues during its embryonic existence.

The bacteria that convert milk, eggs, meat, fish, and other foods into poisons, represent, according to their activity, the ease with which they are able to find the kind of food necessary to their rapid growth or the difficulty placed in the way of their normal nutrition and reproduction.

Bacteria, with a significance worthy of noting here, depend upon the mineral salts and colloids precisely in the same manner as that in which the bodies of men depend upon them.

As we go along we shall encounter many interesting, not to say fascinating, proofs of this statement.

For the present we have learned that a certain combination of some twelve mineral elements is surrendered by our food for the building processes of our bodies.

All foods contain some of these building materials; other foods contain all of them.

Many foods, for instance, contain calcium in the highly organised combinations which are acceptable to the needs of the human body. Commercial methods of manufacture remove this calcium from their products.

Absurd methods of home-cooking also remove them. That such calcium loss should not be tolerated is disclosed by a study of the functions performed in the body by calcium.

Calcium assists the digestive ferments to perform their duties. When food is robbed of its calcium normal digestion does not progress. This influence on ferments is not confined to the digestive tract. In the laboratory and the food factory also we see it at work.

Rennet, for instance, is a ferment. It is used to make curd from milk. Curd is the first step in the manufacture of cheese. That the rennet may perform its duties in the manner expected by the cheese-maker it is necessary that the calcium natural to all normal milk be perfectly soluble. To make sure of this solubility the cheese-maker adds hydrochloric acid to the milk. He knows that if the calcium is thrown out of solution the curd will never become cheese.

Oxalic acid would throw the calcium out of solution. So would sterilisation at the boiling point. In any mixture of milk so

treated the ferment rennet, thus deprived of the influence of calcium, refuses to operate and the cheese maker makes no cheese.

If, while in a state of health, you should cut your finger, the soluble calcium in your blood would cause it to coagulate at the surface of the wound and you would not bleed to death, as you would if it were not for the interference of the calcium at the disposal of nature.

In certain diseases where the normal content of calcium is no longer present in the blood the wound refuses to heal. One of the commonest symptoms of anæmia, acidosis, nervous prostration, etc., is the refusal of even the slightest wounds to heal promptly.

Surgeons, realising the importance of this function performed by calcium, frequently attempt to introduce it into the blood before serious operations in the form of calcium lactate. They do this in order to prevent hemorrhage following the use of the knife.

No hint of the function performed by calcium is ever found on a bill of fare in a restaurant or hotel.

No placard hangs on the wall in the office of the food factory cautioning the factory manager against the toleration of any process of refinement through which calcium or any of the other mineral elements of prepared food are removed and lost to the human family.

Yet when we diminish the proper quantity of calcium in our blood we correspondingly lower our vitality and reduce our resistance to disease.

§ 28—CHILDREN SUFFER, PROSPECTIVE MOTHERS DECLINE

In every kitchen, restaurant, hotel, boarding house, hospital, orphan asylum and commissary food, through ignorant methods of cookery, is not only robbed of its calcium but it is also robbed of many of its other mineral salts and colloids. Before food reaches the kitchen the manufacturer robs it of a large percentage of these priceless mineral elements.

Dr. James R. Mitchell, while lecturer of chemistry at Fort Worth University Medical College, supplemented the work of other investigators by a study which showed 86 per cent. of the

school children of Louisville were suffering from defective teeth, in spite of the fact that they live in the "limestone" state.

It has been said that Kentucky is a veritable quarry of calcium. Yet, in the presence of millions of tons of bone and tooth-building material the children of this calcium kingdom had so much difficulty in finding sufficient calcium for their needs that 86 per cent. of them, in the calcium capital itself, manifested the most conspicuous symptoms of calcium starvation.

With a zeal born of indignation, and therefore, because of its ardor, considered in high places unethical, Mitchell pointed out how dentists prescribe tooth washes and tooth-pastes; how they advocate oral hygiene; how they fill cavities and fit bridges, while all the time the primary cause of tooth-destruction remains ignored.

We know if there is a deficiency of calcium salts in the food the body will actually tear down its own structure in order to obtain the calcium necessary to maintain the integrity of its internal secretions.

In the case of a calcium deficiency in the food the body goes to the only available source of calcium supply, the lime of the teeth and bones. That lime is gradually consumed until, weakening the structure of the teeth, it finally leaves but a shell of fluoride enamel over a honey-combed structure.

In Ireland, where calcium deficiency is conspicuous, there is an old saying among the peasantry. "With every child goes a tooth," runs this adage. The fact that maternity is so frequently followed by tooth troubles, a result of the demand of the unborn upon the mother's tissue for bone-building calcium, has been noted by many observers and probably accounts for the quotation credited to Irish women.

Where calcium is abstracted from the tooth under-structure, the thin enamel, made thinner by fluorine starvation, sooner or later cracks or breaks under pressure, thereby opening an avenue for the entrance of putrefactive bacteria, which begin the work of true decay. The ruin is really accomplished long before any evidence of decay is disclosed.

Sugar and fruit acids have no effect on the enamel of normal teeth. Sound teeth can be immersed in a solution of sugar or

fruit acids for months and suffer no erosion. The experiments of E. Howard Tunison and others have proved this.

Sugar does not act directly on the teeth at all, and the dentist treats the symptom, not the cause, of bone destruction when he plugs up cavities and fits bridges.

This observation is not intended to minimise in any manner the importance of skilful dental treatment, keen appreciation of which is not wanting by the writer.

Sugar and calcium possess a remarkable affinity for each other. When refined sugar or glucose, both of which are mineral-free and, therefore, like distilled water mineral-hungry, are consumed in generous quantities they attack the soluble calcium of the tissues.

The tissues retaliate in turn by sapping the calcium of the blood. The blood, which demands a minimum calcium content, with never relaxing energy steals calcium from the teeth and bones. The experiments of Voit and others prove this.

Druggists know how wonderfully calcium combines with sugar. Accordingly they manufacture what is known as syrup of lime. One thousand parts of water will take up approximately one part of calcium. When sugar is added the water will take up approximately thirty-five times as much calcium.

Children will suffer and prospective mothers decline as long as they consume an excess of refined or denatured, mineral-free sugar, glucose and starch in their diet or as long as food industries continue to remove the soluble mineral elements from the chief sources of their food supply.

As we advance step by step in our study of the indispensable food minerals we shall approach one of the prolific causes of infant mortality; one of the prolific causes of pallor and anæmia among women and, as shall be conclusively proved in its proper place, one of the greatest single causes behind the difficulties of maternity as well as one of the greatest single causes of many preventable ills which attack child and adult alike.

Butcher shops grind the bones of the ox, sheep, and hog into what they call "chicken bone." It has been noted by poultry and egg producers that if hens are not fed a plentiful supply of calcium in the form of such "chicken bones" or in the form of cracked oyster shells or other similar calcium food, they will lay

soft-shelled eggs for a while, then cease to lay eggs of any kind.

The dog which on a meat diet is not also fed bone will, like the human, suffer tooth decay. His skin will be tettered; his hair will fall out, his disposition will be mean.

The lioness of the circus cage fed with meat alone brings forth cubs with cleft palates. Meat does not provide the calcium necessary to the formation of the bones of her cubs.

Caged mice fed with distilled water and processed corn meal, such as is purchasable in every grocery store in the United States, develop "nerves" just as men and women robbed of their calcium also develop "nerves." As the calcium-free diet is continued the mice are stricken with convulsions, passing in the meantime through all the symptoms of pellagra, beri-beri, acidosis, and general prostration.

What are the effects of the removal of the calcium from the food consumed by the large army of adults afflicted at the age of forty and beyond with hardening of the arteries, heart disease, Bright's disease, diabetes, cancer, etc.?

§ 29—ADD ARTIFICE AND SUBTRACT NATURE

In the laboratory when pneumonia germs are studied it is found that a little sprinkle of calcium will revive a culture in a stationary state.

Calcium is necessary for the strength of the bones, for the hardness of the teeth, for the firmness of the muscles, for the tone of the nerves, for the coagulation of the blood on demand, for every pulsation of the heart, for the digestion of the food, for the functioning of the kidneys and other vital organs, for the health of the body.

When a baby is deprived of its necessary calcium its bones are softened. The muscle deprived of its calcium quivers and twitches. The nerves under such deprivation act in similar manner.

We know how oxalic acid acts on the body when introduced with food. We do not know how other chemicals act upon tissue calcium, yet the food manufacturer who employs other chemicals

gives no thought to the manner in which his germicidal agents may interfere with the integrity of life's processes.

Food manufacturers declare their chemical preservatives are "harmless." Scientists are found to agree with them. Thus they set up arguments of such plausible and convincing character that the government has been prevailed upon to permit them to employ chemicals in the manufacture of a hundred food products.

One thing is certain. There is premature and untimely death everywhere. Men and women suffer out fifty years of more or less misery instead of living the same fifty years in a state of bounding, buoyant energy and health. Yet eminent professors declare it is unscientific to connect untimely death and preventable ills with the follies of our diet system.

We shall see as we progress whether it is unscientific to establish such a connection between food folly and disease or whether it is the refusal to admit such connection which is unscientific.

This we know. Some dozen drugs can now be legally put into food intended for interstate commerce and another dozen are permitted by various state governments in the manufacture of foods not intended for interstate commerce.

At least twelve necessary mineral elements can be legally taken out of foods intended for interstate commerce. Thus the manufacturer is permitted to add to nature's formula or subtract from it at will, depending entirely upon what he considers necessary in attaining the commercial results desired.

The 400,000 children under ten years of age who died last year loved their "innocent" cakes, cookies, crackers and biscuits; their "innocent" white bread smeared with syrup and factory jam; their "innocent" gorgeously coloured candies.

We smile at the very thought of the farmer mixing with his carefully and scientifically prepared food the red, blue, green, yellow, brown and purple ribbon dyes of the coal tar family which the law permits the manufacturer of foods intended for human consumption to use.

We smile at the thought of his adding to his cattle food borax, sulphurous acid, saccharine, sodium benzoate, copper sulphate, aluminum sulphate, anhydrous sodium sulphite, butyric ether, amyl ether, œnanthic ether, ethel ether, valarienate ether, formic ether, benzoic ether, acetic ether, esters, aldehydes, coumarin,

vanillin, pyrolygneus acid, soap bark, furniture glue, lamp black, shellac, gum benzoin, paraffine, stearic acid, hydrogenated fats, hydrolised starch and other foodless substances so frequently mixed with the food of the growing child and the nursing mother.

All these substances at this hour are now in use in the United States. With the exception of borax and copper sulphate they are all legal.

Little pigs are tenderly cared for; the young colt, the baby calf, the wee chicks, are watched with a solicitous eye. Caution, vigilance, common-sense, scientific knowledge, are exercised to produce stock that will yield a profit. In consequence, when money is invested in animals they are fed on a diet carefully arranged and their young do not die untimely deaths when their food is of a proper kind.

But human beings! That is another matter. The law says, "You shall not consume carbolic acid, arsenic, opium, cocaine, morphine or heroin, nor shall you purchase them under any circumstances whatsoever unless the law's restrictions are removed by trained and licensed physicians."

The law also says in substance: "The food of your children may be whatsoever the food manufacturer sees fit to sell you."

You are now prepared for the long neglected truths concerning that great human destroyer—the white bread of America. You will now learn exactly how your daily bread is robbed of its vitalising mineral elements, not its calcium alone but its iron, potassium, magnesium, silicon, phosphorus, iodine, its ferments, enzymes and vitamines.

You will now learn how to go about the work of getting your share of straightforward, honest food such as nature provides for you and desires your children to consume.

§ 30—WALKING WITH A BROKEN STAFF

Three times each day for three hundred and sixty-five days each year a table is spread in each of twenty million households in the United States. This means that sixty million meals, however sim-

ple, are served for the pleasure and nutrition of the family between the rising and setting of every sun.

At each of these annual billions of occasions—the exceptions are too few to count—21,900,000,000, to be exact, the housewife places one article of food on the table. Whether that table be set in a mansion or in a hovel, whether it be loaded with an abundance of the luxuries of life or whether its contents be confined to one or two simple articles of food, there is one food always present.

Is it to be wondered at, therefore, that bread is called the "staff of life"?

What then if the staff on which humanity leans so trustingly be broken?

The flour advertisements with which the magazines are crowded tell us peculiar and wonderful things about flour. Millions of dollars are spent annually to inform us that our flour is washed, brushed, scoured, screened, and sifted through grits gauze and silk bolting cloth until nothing leaves the mill but utterly perfect flour! As late as August, 1918, *The Saturday Evening Post* published an advertisement of the Quaker Oats Company, frankly telling the public that "Quaker Best Corn Meal" contains none of the fibrous outer coat, none of the oily germ, nothing but the flinty starchy part.

Millions of dollars are spent annually to exploit the virtues of anemic crackers, denatured biscuits, and foodless cakes. Devoted mothers, believing the statements made to them through the highly coloured printed page and the gaudily decorated bill-board, rely with a profound faith upon the demineralised nutriment which advertising art extols. Their babes, from the very beginning, are taught with a broken staff to walk.

Thus is reared a race of such vigour that it sends in one year nearly 400,000 children under ten years of age where white bread and starchy biscuits are no longer needed.

Nature never made a white grain of wheat and man never knew the meaning of white flour until he conceived the fetching idea of startling his guests with bread as white and lifeless as the aristocratic napery on which it is served.

The unrefined grain of wheat as it comes from the field contains in organic form the twelve mineral substances needed for the health, growth and life of the animal body. Chickens, guinea

pigs, white mice, or monkeys fed on bread made from the unrefined wheat thrive indefinitely, but chickens, guinea pigs, white mice, or monkeys fed on an exclusive white bread diet perish in from five to seven weeks.

Wherefore the whiteness of white bread? How is this whiteness obtained? These are questions which we have set out to answer.

White bread becomes white because from the ground grain of wheat three-fourths of the mineral salts and colloids, including the salts of calcium, phosphorus, iron, potassium, chlorine, fluorine, sulphur, magnesium, manganese, etc., are removed. These mineral substances are contained in the brown outer skin, the cells underneath this skin and the germ of the wheat berry. They are sifted and bolted out of the ground meal leaving behind the white starchy cells and the refined gluten of the interior part of the berry.

Nature, in her most benevolent efforts to teach man that he cannot trespass with impunity against the laws of life, through thousands of years of agricultural experience, has failed to impress him with the priceless value of these subtle substances in the assembling of which for his needs she travels through so many subtle and divers paths.

In the whitening of flour not only are the mineral salts and colloids removed from the wheat, but its ferments or vitamines, one of which was discovered by M. Mege Mouries in the inner cortical part of the wheat, are rejected.

The millers who make our flour and our corn meal assure us that they are conferring a great blessing upon humanity in preparing a refined white product. To obtain a still whiter whiteness they even go so far as to bleach by an electro-chemical process the demineralised flour which passes through their silk bolting cloths.

To confront them with 400,000 children under ten years of age who died in the United States last year, notwithstanding the daily familiarity with white breadstuffs which these children suffered without resistance, is but to provoke a smile fortified by "proofs" of the benevolence of their conduct. These "proofs" usually bear the signature of scientists.

What scientists' signatures can open up those little graves and deliver back to the fond and empty arms of grieving parents the

million five hundred thousand children that have died in this country during the past four years?

What will scientists' signatures do for the enfeebled soldiers who survive the European war or for their half-fed widows and orphans during the reconstruction period that faces them?

In the many public controversies which I have had with the millers they have frankly admitted that they do not give the people white flour or white bread products through their own choice. They say that because the people think they want white flour and white bread they are obliged to cater to such wants. These admissions are nevertheless usually accompanied by a statement that white bread as contrasted with bread made from the whole grain possesses "superior digestibility."

Nothing is said of the alarming increase of cancer, diabetes, Bright's disease, heart disease and hardening of the arteries now causing so much concern among life insurance companies on account of the fact that their chief victims are found in middle age.

Nothing is said about the fact that at the age of forty, when man should be at his best, and continuing until his fiftieth year the increase in these diseases is at its height.

There is much evidence to indicate that middle-age mortality is directly associated with denatured food. All of such evidence will be submitted here in its proper place.

Of course there are other causes also at work in the production of some of these increasingly prevalent middle-age diseases but the facts which will be treated with sufficient detail, indicate conclusively that demineralised and refined food is chief among these causes.

§ 31—"DIGESTIBILITY" AND "INDIGESTIBILITY"

There are many prejudices to overcome before whole wheat bread, whole wheat cakes, whole wheat biscuits, whole wheat muffins, whole wheat waffles and other whole wheat breadstuffs, with all their wealth of vitality, can be restored to the people.

Some of the millers declare the bran of wheat is a powerful irritant and, therefore, people not in normal health cannot use it without injury.

They say whereas bran in whole wheat might be advantageous in special cases—an admission suggested by the recent appearance on the market of numerous brands of bran—it is an undesirable element in bread because it is "indigestible."

Pepper is "indigestible," so is nutmeg, cinnamon, ginger, mustard, mace, allspice, cloves. The fibre of orange, pineapple, celery, string beans, asparagus, canteloupe, is "indigestible." The seeds of strawberries, raspberries, figs, grapes, are "indigestible," just as the bran of wheat is "indigestible" and for the same reason, if the word "indigestible" is assumed to mean that in their journey through the body none of these substances is taken up by the body and transformed into tissue.

None of such substances is actually indigestible. In its course through the body the bran surrenders its soluble extractives which are taken up by the tissues and the residue which remains behind is a water absorber. As such it performs a most important and necessary function in the intestines.

Every time we eat a roasted or boiled ear of corn we eat the bran. Every time we eat Boston baked beans or fresh peas we eat the bran of these legumes. It is well that we eat these things because, while they are not digested in themselves in the sense of being taken up and oxidised in the production of heat or energy, they nevertheless contribute to the body the soluble salts and colloids which they contain and without which energy-producing foods are useless to the living body.

Let us take an animal membrane such as a bladder and fill it with a solution of any of the food minerals and hang it on a nail against the wall. It will hang there for days, weeks, or months, and there will be no leakage of its contents through the skin. Not a drop will ooze through the membrane to appear on the outside. We see that it guards its contents as faithfully as would a glass bottle properly corked.

If we now take the filled bladder and immerse it in a tub containing another solution of different density a remarkable phenomenon will be observed. The contents of the bladder will begin to pass out through the membrane into the solution on the outside, and the solution on the outside will begin to pass through the membrane to the inside, so that eventually the solution on the

outside and the solution on the inside will be identical in character.

The dissimilar liquids will be thoroughly diffused. The process by which this diffusion is brought about is called osmosis. Osmosis is going on in the body all the time.

We create and thus change the mineral constituency of the internal secretions every time we eat. We thereby continue to change the character and density of the fluids in which the cells are bathed. Thus do the cells obtain their nutriment. As long as life continues osmosis does not cease. Protoplasm derives its nutriment through this process of osmosis.

In fevers or wasting diseases accompanied by extreme exhaustion as the result of inability to consume food, or in cases of starvation, the fluids inside the cells gradually become identical in specific gravity with the fluids in which they are bathed so that osmosis becomes very feeble. When it ceases altogether death ensues.

The minerals nature has put into wheat and the other grains and man so deliberately removes from his diet are lost to all his needs and the vitalising mission they are designed to perform are not performed.

Just as chopped meat surrenders its mineral salts to the water in which it is immersed so also does the bran of the grain surrender its minerals to the internal secretions of the body.

But bran not only furnishes indispensable mineral salts to the body. It also acts as a regulator of the peristaltic action of the alimentary tract by which the contents of the intestines are kept moving onward and downward.

One of the curses white bread and refined grain foods impose upon humanity is constipation. A thousand ills are traceable to this disorder. Patent medicines by the hundreds have been marketed in order to help pill-consumers bridge over the misery their white bread inflicts upon them.

Constipation is the malevolent origin of the woes of many American women who, through the congestion set up by inhibited peristalsis, are afflicted with uterine and ovarian disease that make their lives miserable.

Constipation is not the trifling disorder the public foolishly believes it to be. We are about to see how grave it really is and to

what extent it undermines the health and vitality of America. A proper understanding of the significance of constipation will destroy the white bread superstition.

§ 32—CONSTIPATION

The world little suspects the gravity of constipation, or the readiness with which it submits to correction. Even the physician needs to be reminded of the serious nature of this preventable and entirely unnecessary evil.

Listen to what Drs. John H. Musser and George Morris Piersol of the University of Pennsylvania have to say to their brother physicians throughout the United States if you would appreciate the folly of looking upon constipation as a trifling disease. Here are their words:

"No clinical symptom is more frequently encountered in the practice of medicine than constipation. The commonplace and obstinate character of the affection is perhaps responsible for the prevalence of the idea that constipation is a necessary evil rarely capable of permanent cure.

"As a result of this false and dangerous attitude the people are prone to look upon the condition with indifference, which allows them to be content with a certain degree of temporary relief, too often brought about by the easiest means at their disposal, namely, the use of purgative drugs.

"This attitude is not only erroneous, it is harmful. Constipation is but a symptomatic expression of some underlying disorder, and any treatment to be efficient must be directed, not to the temporary removal of the symptom, but at the cause.

"Dietetic errors are among the most frequent general causes of constipation. These consist in food which is deficient in residue (bran) by reason of which the bowel is deprived of the mechanical and chemical stimuli necessary to promote proper intestinal activity.

"A diet suitable for constipation must be one which will furnish adequate stimuli to the intestinal mucosa by means of undeposited

residue and the various chemical substances elaborated during its digestion."

Do these words of Drs. Musser and Piersol, directed in such serious manner to the medical profession, clash with the philosophy of ridicule preached by the millers? To the victims of constipation who are so easily influenced by plausible assertions I leave the answer.

"Be careful," say the millers, "on your journey, John, not to eat any white bread. If you do your teeth will fall out. Be sure somewhere to get a spoonful of bran in your grub or you will become a victim of the Philippine itch. Keep a sharp lookout for that brown, brindled, spotted rough stuff known as whole wheat bread or you will surely perish."

In the face of this sort of attack, aimed at the weakness of human nature to withstand the assaults of ridicule, however far-fetched, great truths are content to be smothered and old evils abide with us unmolested.

Drs. Musser and Piersol are explicit in their advice to their fellow-physicians. Here are their plain statements:

"Whole wheat bread, whole rye bread, or pumpernickel should be used in preference to white bread.

"Whole oatmeal and the coarser cereals, such as whole corn-meal, are important adjuncts."

The scoffers must surely experience difficulty in dismissing such statements when they emanate from recognised authorities.

What we want, however, are not statements, but proofs. This is why we began at the beginning, why we are content to make progress step by step, why we are dealing only in established facts.

The references of Musser and Piersol to whole oatmeal, whole corn meal, and the coarser cereals will, in their proper places, release a volley of proofs, each one of them sufficiently startling in itself to provoke a panic among the commercial beneficiaries of denatured breakfast-foods and breadstuffs.

It has been conclusively established that bread made of the whole wheat, just as it comes through the cleaning machines from the field, together with the other unrefined foods to which these words are dedicated, will save our daughters and our daughters'

children from the hundred evils which food follies have imposed upon them.

Dr. Albert Westlake, in his paper on "Babies' Teeth to the Twelfth Year," says:

"Babies' teeth should receive consideration at least six months before the child is born. Necessary elements in their building are furnished at this period by the mother's blood.

"Teeth require more organic phosphates, particularly the phosphates of calcium, and more calcium carbonate than other parts of the body; therefore, bone food is necessary for the mother (cows' milk, eggs, especially yolks, peas, beans, lentils, whole wheat, outer grains, etc.). Dietetic treatment for the mother is very important at this period while bone is forming.

"The intestines of the child are also undergoing vital changes at this period and earlier. This includes, as has been established by Dr. Herbert D. Pease, the primary fixation of the child's intestine in the left hypochondriac region.

"It is therefore vital to the off-spring to establish perfect peristalsis of the mother's intestines. Elimination and evacuation should be regular without drugs. Constipation is the enemy of both mother and child."

§ 33—SUSPECTED CAUSES OF CANCER

Because constipation in the United States causes more human misery than drunkenness we shall not dismiss the subject until it is considered in connection with the prevalence of acidosis and cancer, now on the rapid increase from coast to coast.

The demand for laxative pills, cathartics and heart depressors for the relief of constipation and the headaches due to the absorption of retained toxines from congested intestines overloaded with decay, is greater than the demand of the "morning after" for bracers.

It is needless to reassert this truth, for all of us know that if we ask any druggist what one so-called remedy is most coveted by the human race we shall be told that "constipation pills" sit

on the mountain top of popular clamour for relief from distress.

The average creature, who lives largely on food deficient in cellulose, fibre, and mineral salts, needs no description of the misery constipation begets, but there is another warning for such creatures which should not be ignored.

Diagnosticians are agreed that many of the ills that plague human nature are preceded by a history of constipation. They also agree that freedom from constipation averts many ills.

They are not agreed upon the cause of cancer. Some of them believe cancer is a premature aging and breaking down of the cells. They hold that certain cells become aged while the tissues around them are still in a state of comparative youth. The aging cells they say express their senility by returning to a more embryonic form and as they do so increase in number, thus resulting in the morbid growth they call cancer.

In the opinion of many cancer specialists this faculty of multiplication is one of the manifestations of degenerating cells.

Other cancer specialists hold that cancer is the direct result of irritation, either mechanical or chemical, and that it may be produced by the absorption of an unidentified poison.

Still others believe that it is produced by the invasion of a parasite yet unrecognised and too small to be discovered by the most powerful microscope. While they are all in doubt about the origin of cancer, they all know it is increasing at the rate of 2.4 per cent. a year in the United States.

Dr. Horace Packard of Boston University, discussing the cancer question before the Surgical and Gynecological Society of the American Institute of Homœopathy at Chicago, June 28, 1915, declared that demineralised foods form a factor in the development of cancer.

"The human family is underfed in mineral food salts," he said. "A momentous fact is that the flour mills of the civilised world are busy eliminating every particle of iron, phosphorus, sodium, potassium, silicon, calcium, chlorine, magnesium and sulphur (mineral salts) from our staple food supply and sending out food material rich in heat units but pitifully meagre in energising and immunising material.

"Since a critical examination of the habits of life of civilised

cancer-plagued people in comparison with the habits of primitive cancer-free people shows that the main difference between them is in a dietary poor in mineral salts among the cancer-plagued people and a dietary rich in mineral salts among the cancer-free people, the most logical and rational course is to adopt this as a keynote to cancer treatment.

"All forms of malignant disease are possible only because of absence of or loss of immunity. All animal life in normal state of environment and supplied with nutriment bearing all the organic ingredients necessary for the maintenance of disease-resisting vitality possesses in itself a protective immunity to cancer.

"In view of the well established fact that in the vegetable world an adequate supply of the earth's salts, phosphorus, potassium, iron, magnesium, silicon, calcium, etc., acts as a distinctive deterrent of parasitic life and makes for vigorous disease-resisting life, may we not assume as much for the animal world?"

There is indeed a direct relationship between the known causes of constipation and the suggested causes of cancer. This relationship is based upon the loss of cellulose, mineral salts, colloids, and vitamines in our breakfast foods and breadstuffs.

Take, for instance, the bran of wheat, one of the food elements lost to modern cancer-plagued civilisation. Wheat bran consists of three layers, all of which contain larger proportions of cellulose or fibre than the interior of the grain.

The two outer layers contain more of the phosphorus, calcium, and iron compounds than the other parts of the grain; while the innermost layer contains a special kind of protein, which is the seat of the indispensable vitamines lost in the milling of wheat.

As we have seen, bran is not so "digestible" as first-patent flour for the reason that all of first-patent flour is absorbed whereas all of the bran is not absorbed. The mistake of estimating the food value of any food by its ability to undergo complete absorption has already been recognised by many authorities and it is to be hoped the medical profession will soon give to the non-absorbable food elements the importance that belongs to them.

THREE: WHY MODERN REFINING PROCESSES ARE MORE DEADLY THAN WAR

THREE: WHY MODERN REFINING PROCESSES ARE MORE DEADLY THAN WAR

§ 34—CORN MEAL OR CORNLESS MEAL

The folly of comparing the "digestibility" of white patent flour with the "indigestibility" of bran is self-revealed through the very nature of the arguments employed by the millers.

"Complete absorption" means constipation. Deficiency of mineral salts means constipation. Absence of cellulose or fibre means constipation. Bran takes up moisture and holds it in the intestines, thereby making the intestinal mass more elastic, stimulating peristalsis and increasing the rhythmic waves of contraction and relaxation so necessary to the process of elimination.

Bran surrenders to the body the solubles it contains. These solubles, physiologically active, are absorbed to perform the metabolic task assigned them. Had God not meant them to be present He would not have called them from the void.

Bran is but one of the discarded particles of wheat, corn and rice. Its importance must not be overemphasised at the expense of the other discarded particles. Bran in itself is not a food; it is merely a natural constituent of wheat, corn, rice, peas, beans, etc.

White patent flour contains approximately 11 per cent. protein; bran contains 15 per cent. Flour contains 1 per cent. fat; bran contains 4 per cent.

The lecithins or phosphorised fats are found in the bran and in the germ of the grain. In the milling of patent flour and refined corn meal the lecithins are discarded.

Patent flour, like refined corn meal, contains less than one-half of 1 per cent. mineral salts. The bran and germ of the grain contain nearly ten times as much. Of phosphorised compounds alone bran contains twelve times as much as patent flour.

This does not mean that bran is a substitute for whole meal. It is not. Bran lacks many of the elements found in the cells

of the thin outer skin of the wheat. It is the whole grain, with bran and germ included, nothing added and nothing removed, that is ground into honest, adequate, God-given meal.

Such meal is rich in all the food minerals and vitamines essential to animal life, containing just that quantity of bran necessary to make constipation impossible.

Where constipation is avoided the absorption of the irritating and poisonous end-products or toxines of intestinal putrefaction is rendered quite impossible.

Thus one of the suspected causes of cancer and of many other diseases, including hardening of the arteries, is also avoided. Involuntary suicide and auto-intoxication are synonymous.

The proposition that bran or any other food adjunct will cure cancer is not advanced here. Foolish would be the cancer victim who resorted to bran as a cancer cure, but there can no longer be any doubt that the absence of these essential food substances from the diet are responsible for the development of many diseases.

Our government in 1917, to extend the supply of wheat and to improve the nutrition of the masses, contemplated the wisdom of restricting the consumption of wheat to whole wheat. The millers of patent flour seeing in this project grave danger to their industry, succeeded in thwarting the movement.

Our government then urged us to eat wheat substitutes, emphasising corn in particular.

Certainly our boys "over there" wanted us to follow our government's suggestion. They wanted us to eat corn. We can say this positively, because we know they wanted us to do everything necessary to win the war.

We knew that without the sacrifice of life on the battlefield and without the sacrifice of pet ideas and cherished habits at home, speedy and decisive victory could not be achieved, yet we did not consume corn as we should. We did not make a soldier's honest effort to secure the kind of corn we should have had.

Our indifference to corn can be explained by the fact that the kind of corn now served to us is not only flavourless, due to the milling system that robs it of its flavour, but like white wheat flour, it lacks the indispensable substances of an adequate diet.

In asking us to eat corn our government certainly wanted us

to eat the right kind of corn. We can get the right kind of corn by going after it. God grows no other kind.

We know that corn will produce the finest poultry ever grown, but we have doubted its value as a human food, not knowing that the kind of corn fed to poultry is not the kind fed to the human.

We know that corn will produce an abundance of eggs, but we are sceptical of its ability to nourish human tissues, not realising that the kind of corn fed to human beings will not produce eggs.

We know that corn will produce the heaviest and meatiest beef which only the great corn belt of the Middle-West is capable of producing, but we assume that it will not put on the backs of men the flesh it will put on the backs of cattle. Yes, it is true that the kind of corn fed to man will starve cattle.

The near-corn for which man tries with little success to develop an appetite will kill poultry, hogs and cows. Chickens fed on it will die in less than fifty days. Children fed on it to the exclusion of other offsetting foods will speedily develop pellagra.

Children fed on it with an insufficiency of milk and fruit so lose vitality and resistance to disease that they become easy victims of any infection that passes along.

What then is the difference between corn that will nourish animals and near corn that will kill animals? between corn that will nourish men and near corn that will not nourish them?

Why do farmers recognise this difference, providing only the right kind of corn as food for the animals in which their money is invested?

Why do fathers and mothers of children ignore facts that farmers apply to the development of their live stock?

Would our boys in the trenches, fighting for the betterment of the human race, ask us to answer these questions if they knew the answer, honestly applied to our own home needs, would increase our health, strength, stamina and endurance, and by releasing other necessary foods to our soldiers and our allies contribute heavily to the winning of the war?

Of course, they would.

What then are the facts?

The whole kernel of corn contains 10 per cent. protein. Re-

fined corn meal contains less than 8 per cent. This protein difference is of little moment, but it represents a deficiency which becomes progressively worse as we go down the line of nutritive substances withdrawn from refined corn meal.

God puts these substances in the grain; man takes them out.

The whole grain contains 4.3 per cent. fat derived chiefly from the germ. This fat is not like lard. It is a highly complex substance containing the "fat soluble A" without which no young animal or child can grow, and without which no adult can maintain health.

In refined corn meal only one-fourth of the original fat of the kernel is preserved. In whole corn meal we find the vitalising mineral salts, all of them, to the extent of fifteen parts to the thousand, whereas in the refined corn meal only four parts are left, many of the salts having been removed entirely.

Like whole wheat, the kernel of corn has a fibrous outer skin beneath which is a layer rich in protein and phosphorus compounds of complex character. This layer is called the gluten layer. Within it lies the germ.

All these layers and the germ itself with their rich mineral compounds and vitamines are discarded in feeding man, although carefully preserved in feeding animals. Yet the laws of nutrition apply to man and beast in the same manner.

Not only do these substances, discarded in our effort to "improve" on God's handiwork, contain the vitality of the corn, they also contain its flavour, both of which are lost in the refining process.

This loss makes man instinctively turn his back on corn.

Certainly in war and in the reconstruction that follows war we ought to be just as much concerned in putting beef on the backs of our soldiers and workers as upon our corn-fed animals.

Thousands of our doctors and nurses went to the other side in 1918. Surely when medical attention for preventable ills at home becomes scarce we need more resistance than ever.

Why do we tolerate any dietetic condition that menaces the health of prospective mothers, of nursing mothers, of growing children, of workers in shipyards, munition plants, factories or shops?

It is our duty to aim for efficiency and productivity, free from the handicap of preventable afflictions.

Even in peace when we succumb to deficiency diseases caused by a one-sided diet our doctors cannot help us unless they restore the missing nutritives of which we have been deprived.

The archives of the United States Public Health Service at Washington are filled with records that prove this assertion.

What, then, shall we do about it if we fail to insist that all our millers of corn meal shall give us the whole grain, freshly ground?

Of course, our mills should be nearby.

Corn will keep for years unground. Only when tempered with water and ground long before it is needed does corn spoil. Spoiled corn is unfit for food, but it need not spoil.

The trouble with the corn miller is that when he releases his demineralised, degerminated and impoverished meal he wants none of it to return a thousand miles to him "out of condition." He wants it to stand on the shelf of the grocery store a year, if necessary, and not become rancid during the interval.

He is not concerned with the food properties of his product. He is interested in the profit per package. Such ideals do not win wars, nor do they conserve the health of the nation, nor do they inspire men who understand them to lay down their lives in their perpetuation.

Fortunately, at an expenditure of five or six dollars we can obtain little grinding machines for use at home. With them we can make our own whole corn meal as well as our own whole wheat meal if our grocers refuse to provide the unrefined product. Once the millers witness an invasion of their field by a sufficient number of hand mills to make them pause in their present system, they will begin to vie with each other in the production of grain foods as they should be produced.

§ 35—ANEMIA, TUBERCULOSIS, HEART DISEASE

Constipation is the enemy of mother and child. It is widespread among adults of both sexes. It gives rise to many physi-

cal ills which originate in congestion, inflammation, irritation, and absorbed toxines.

There are many reasons why the prospective mother and her unborn babe should not be robbed of the salts of food.

The millers will never know how many babies they have handicapped from birth. See section 99.

Be it remembered that no chemist can tell us in terms of grams anything about the exact quantity of phosphorus, iron, potassium, lime, silicon, sodium, magnesium, manganese, sulphur, chlorine, fluorine, or iodine which we should take into our bodies every day.

Nature has fixed that mysterious and hidden formula for us, yet, confounded in our wisdom, we turn our backs upon the truth and seek destroying novelties in the paths of darkness.

The chemist admits he can never tell us the exact quantity of these bio-chemic salts necessary to the life and health of the human creature.

Three chemists at Columbia University devoted months to a study of but three of the twelve food minerals, determining nothing as to the quantity of them required, but determining everything as to their necessity.

Humanity seems unwilling to trust the Creator in this respect. Eminent scientists seem unable to believe that all natural unrefined foods, whether they be fruits, grains or grasses, contain all the elements necessary to see them safely on their journey through the body.

By assuming the right to manipulate, modify, or destroy the presence and proportion of these food minerals in commercial breadstuffs, they refuse to see the wreckage they have left in the wake of their mineral contempt.

They do not know how they have burrowed into the vitality of human life while it is still in the mother's womb.

They do not suspect to what extent they have been responsible for anemia, tuberculosis, heart disease, and the other ills, such as pneumonia, diphtheria, scrofula, measles, appendicitis, diabetes, Bright's disease, cancer, etc., that follow lowered resistance and the destruction of immunity.

We cannot go into a theatre, church, public building, trolley car, or walk along the dusty city streets without inhaling the

living micro-organisms which cause tuberculosis, yet, if our resistance is normal, we need have no fear of the disease because the germs are destroyed as fast as they enter our bodies.

If this were not so, because everybody is exposed to tuberculosis, all the nations of the earth would perish from this disease.

In typhoid epidemics all do not develop the disease. Normal vitality provides in some the resistance necessary to combat the assault, however violent.

Through the facts to follow we may obtain some hint of the relationship our denatured foods now bear to the constant increase in those diseases of adult life, cancer, diabetes, Bright's disease, appendicitis, hardening of the arteries, and organic heart disease, which are destroying so much of the best among men and women.

§ 36—REJECTED FOOD MINERALS A MOUNTAIN OF FOLLY

To obtain an adequate conception of the gigantic scale on which the nation is now undermining its vitality we must examine a few extraordinary figures as large and significant as the tabulations of disease and death with which they are related.

In 1915 the United States produced the largest yield of wheat ever grown in any country of the world—1,002,029,000 bushels. This wheat was worth $932,888,999.

Of corn in 1915 the United States produced 3,090,509,000 bushels, worth $1,913,025,071, the most valuable corn crop ever grown.

The barley, rye, and rice crops of 1915 in point of production established records.

The barley was worth $118,577,682, the rye $37,861,403, the rice $22,313,350.

In addition there was a record buckwheat crop worth $12,854,750. At the 1918 war values these grains were worth three times as much in cash but just as little in food value.

Here surely, according to the statistics announced Nov. 8, 1915, by the Department of Agriculture, was reason for the

celebration of a joyous Thanksgiving throughout the United States.

Yet, from all this wheat, corn, barley, rye, rice, and buckwheat, from all of these hundreds of thousands of tons of the breadstuffs of the nation, the phosphorus was removed, the potassium was removed, the iron was removed, the manganese was removed, the magnesium was removed, three-quarters of all the mineral salts and colloids, all of the ferments, enzymes, and vitamines were removed.

Two per cent. of the total weight of wheat consists of mineral salts. Rice contains less, oats more, corn nearly the same.

What a tragedy has been enacted through the washing, screening, sifting, and bleaching of our wheat, through the brushing, scouring, and polishing of our rice, through the degerminating of our corn, through the pearling of our barley, through the thinning and extending of our buckwheat; through the refining of our rye!

Take wheat alone as an index of the extent of the losses sustained by humanity through the denaturing processes through which all these grains are prepared for human consumption.

Each bushel of wheat produced in 1915 weighed 57.9 pounds, a total of more than 580,000,000,000 pounds, of which 2 per cent., or more than 5,000,000 tons, consisted of food minerals. Of these five million tons three-fourths were completely lost in the refining process. Here, with wheat alone, we witness the wanton destruction of nearly four million tons of the food elements most indispensable to the health of man, woman, and child.

We see the deliberate rejection of the keystone of the arch, yet when we add to this the rejected food minerals of our corn, barley, rye, rice and buckwheat we build up a mountain of folly so colossal in its menace to the human race that well, indeed, may statesmen tremble when they behold its dimensions.

Other nations have taken alarm as proof after proof of the ravages for which foodless foods are responsible have been disclosed.

In May, 1912, I received from the honourable secretary of the Bread and Food Reform League of England a record of the experiments conducted by Dr. Frederick Gowland Hopkins, Fel-

low of the Royal Society, reader in chemical physiology of the University of Cambridge.

Hopkins experimented with an 80 per cent. whole wheat meal which, though not containing all of the wheat, yet retained a much larger proportion of the bran and germ than white flour.

Even with such semi-impoverished material the results of his investigations were so remarkable that they inspired a belated agitation in behalf of whole meal loaf or, as it was called by the London *Daily Mail,* "household bread."

At the same time Dr. E. S. Eddie and Dr. G. C. Simpson, members of the research staff of the School of Tropical Medicine, University of Liverpool, carried on investigations in which the effects of refined flour and white bread upon children and adults were carefully studied in contrast with the effects of whole meal or whole wheat bread.

An extended research was also conducted by Dr. Benjamin Moore of the Liverpool School of Tropical Medicine, in which groups of pigeons were fed on bread made from fine white flour, while other groups of pigeons were fed on whole wheat bread.

The results afford further irrefutable evidence of the essential health-giving qualities of those parts of grain and cereal foods which are discarded in the milling of flour, polishing of rice, pearling of barley, refining of rye, and the degerminating of corn.

One thing we know: the mountain of rejected food minerals is balanced, alas, how inadequately, by a lake of patent medicines.

§ 37—OUTER PARTS OF THE GRAINS AND THE NERVOUS SYSTEM

Dr. Frederick Gowland Hopkins, department of chemical physiology, University of Cambridge, will prove a stumbling block to all millers of "patent" flour. He says:

"The superior value of whole wheat meal lies in the fact that it retains certain food substances whose presence allows our systems to make full use of the tissue-building elements of the grain. These substances are removed from the fine white flour in the milling.

"All my work to date confirms my belief in the superior food value of standard whole wheat bread. After definitely proving that young animals grow with very much greater rapidity on brown flour than on white flour, I have been able to improve the tissue building rate of the white flour subjects by adding to their white flour an extract made from the brown flour.

"To make the best use of any food material, such as the proteins for instance, certain other food substances and possibly a variety of them must also be present in definite proportions.

"If one essential food constituent which ought to make up at least 1 per cent. of the total food is present in only half its normal amount, then when it is a case of building up the tissues the system will only be able to make use of half of the other food elements even if these other food elements make up the main bulk of the food.

"This principle has long been recognised as regards plant life and growth. A plant in order to attain perfect growth must find in the soil a certain minimum of each of many elements.

"Consider, for example, the element potassium. If only half the necessary amount of potassium be present, then, no matter how abundant may be all the other soil and air constituents, their normal utilisation is limited to one-half. The rate of growth and the ultimate development of the plant are consequently depressed.

"The absolute amount of potassium employed in growth is very small compared with the carbon or nitrogen; but any deficiency in it limits growth as surely as a deficiency in the more important elements.

"The substances of unknown nature may need to be present in very small amount, but if the necessary minimum is not available the utilisation of other constituents in tissue growth or repair is infallibly deficient.

"In the process of converting the wheat grain to fine white flour these elements are lost or destroyed. It follows that no matter how much nourishment they might otherwise contain our systems cannot make the best use of such nourishment, owing to the absence of those elements necessary to their assimilation."

The conclusions of Eddie and Simpson of the research staff of the School of Tropical Medicine, University of Liverpool,

throw still another light upon the experiments of Hopkins. They say:

"It has been proved by Braddon and other workers in the East that exclusive use of polished rice as a diet leads to a form of acidosis or peripheral neuritis. This disease does not occur in those native races who use whole rice or unpolished rice as a diet.

"Our own experiments have been extended to similar work in relation to the stripping of the outer case from the wheat berry so as to produce a white bread instead of a brown bread and we find that parallel results are obtained when the outer layers are excluded from the diet with both wheat and rice.

"These experiments clearly demonstrate that the outer part of the grain contains the essential constituents for the nutrition of the nervous system both in growing animals and in adults."

Benjamin Moore, chief of the biochemical department of the Liverpool School of Tropical Medicine, as the result of his laboratory research, was forced to the following conclusions:

"Groups of pigeons have been fed on fine white bread made from white flour known to be unbleached and unadulterated, while similar groups of pigeons have been given an ordinary quality of whole wheat bread.

"The white bread pigeons have all speedily developed marked symptoms of malnutrition and serious nerve derangements. Besides losing weight they sit listless and shivering, lose power in their legs, suggesting nerve paralysis, while many develop convulsions.

"The whole wheat bread pigeons, on the other hand, continue healthy and up to normal weight.

"In another series of experiments pigeons which had developed grave nervous symptoms on a white bread diet recovered completely when, after a week of special nursing, they were placed on an exclusive whole wheat bread diet during their convalescence."

§ 38—STUNTING THE GROWTH OF THE YOUNG

"All the recent work done in the biochemical laboratories of the Liverpool School of Tropical Medicine proves beyond

question that in all cereals, such as wheat, barley, oats and rice, there are series of important substances incorporated in the inner layer of the husk which are essential to the nutritive value of the grain." These are the words of Dr. Benjamin Moore, chief of the biochemical department of that institution.

"If these elements are eliminated in the milling or preparation of the grain, a diet largely composed of cereals or bread thus denatured will not only fail adequately to nourish the body, but will tend to set up active disease.

"Certain of the diseases of malnutrition among children, notably rickets, scurvy-rickets, tetany and convulsions, present symptoms very similar to those we note in our white bread pigeons. So striking is this similarity that physicians who have followed up our work are already treating certain of their malnutrition patients with a diet of whole wheat bread.

"Our nerves as a nation are much less stable than in the days prior to a white bread diet. All our work suggests that the growing tendency of the age to neurasthenia, 'nerves,' etc., is not unlikely due to removing from our diet those very elements of cereal food which nature has hid in the husk of the grain, and which man, in his ignorance, discards."

A special meeting of the British Association and the Health Congress of the Royal Institute of Public Health was called at Portsmouth to consider the results of the work done by Hopkins, Eddie, Simpson, and Moore. Little has come of this work for the reasons that such discussions usually take the form of ponderous scientific data and the people learn nothing of them.

Prior to the investigations of these British scientists an extensive research into the same subject had been conducted in France. Armand Gautier, internationally eminent, had explored the entire field of nutrition, inspiring numerous other French scientists to undertake work of similar nature.

All of them have arrived at the same conclusion. Man has lost the instinct of nourishing himself. The lower animals, when left to themselves, have an innate knowledge of proper food, but it is necessary that mankind be instructed in a certain amount of scientific knowledge in order that a health-sustaining and disease-resisting diet may be selected.

Just one week before the grim day in which France became involved in the conflagration that spread over the nations of Europe in 1914, a little group of French scientists, with no thought of the calamity so shortly to overtake the world, gave to humanity the results of their experimental research into the dangers of feeding with refined cereals.

Their conclusions were published in a French medical journal, July 25th, 1914. Born as they were in the agonies of a reign of destruction and death they possess peculiar significance to the people of the United States, who, a few weeks later, were advised by various commercial-scientific committees, seeking to solve the problem of war prices, to turn away from wheat and wheat flour and consume rice, rye, barley, corn, and oats instead.

E. Weill and G. Mouriquand were two of the investigators who carried on numerous experiments with a refined and demineralised diet for the purpose of determining its effect upon the artificial production of anemia, nervous prostration, interference with the growth of the young, and the breaking up of the natural forces which, in the healthy, well-fed animal, enable it to resist disease.

Their conclusions, literally translated from the French, are as follows:

"To determine whether the effect of feeding pigeons with pearled barley would bring about the same loss of health as that which follows feeding with white flour we fed groups of birds with such barley, which, like refined wheat, is deprived of its germ and outer layers containing the mineral salts and vitamines of the seed.

"The pigeons thus fed showed similar waste and paresis of the limbs and wings as has been frequently noted on a white bread diet. These symptoms were followed by ataxic cerebellar or labyrinthine phenomenon—the animals falling backward or laterally with hyperextension of the limbs and head, ending in death. A cataleptoid condition sometimes preceded death where there had been no previous symptoms." Again see section 99.

§ 39—INCREASED CONSUMPTION OF MEAT

Not content with the results of their experiments, which demonstrated the inadequacy of pearled barley as a life sustaining food, Weill and Mouriquand subjected pigeons to a mixed diet of pearled barley, polished rice, and bolted wheat flour from which the germ, the bran and underlying layers, containing the salts, had been removed.

Weill and Mouriquand expressed the results of their experiments in these words:

"All the pigeons fed on this mixed diet of polished rice, pearled barley and bolted wheat flour showed paralytic disturbances ending in death. We have thus proved that symptoms of the beri-beri type can result from a diet of refined cereals.

"Nutritive disturbances in infants are doubtlessly, at times, caused by a too exclusive feeding with exhausted flour derived from decorticated cereals.

"The physician should take care to vary the diet of the weaned child and include in it cereals from which the pericarp, bran and germ have not been removed."

Six months later another Frenchman, A. Balland, national associate of the Academy of Medicine, issued a warning to the French government in which he said:

"Several times I have pointed out the exaggerated development of the bolting of flour, which augments the price of bread and diminishes its nutritive value.

"Notwithstanding the known facts it is in vain that some of our most distinguished physicians, eye-witnesses of the miseries suffered in hospitals, who are anxious for the future of the race, have arisen against the invasion of white bread.

"The bolting of flour, flavoured by the world-wide cultivation of wheat, which is extending every year, reaches at the present time as much as 50 per cent. of the weight of the grain, while less than fifty years ago only 13 per cent. of the grain was unutilised in flour milling.

"Household bread has disappeared from the ration of the French army and this fact is specially dwelt upon by those who

dread the effects of the use of white bread because never in the history of France is there greater need than just now of well-nourished, active, and long-enduring soldiers.

"Recently the bolting of flour used for the French army bread has discarded from twenty to thirty per cent. of the weight of the grain. The result has not let itself be long waited for. Everywhere the ration of bread appears insufficient; the hunger of the soldier is less satisfied.

"At the beginning of the French revolution, when the army bread was made entirely of unbolted flour, the subject was placed before the Academy of Sciences for a decision concerning the advisability of removing a portion of the grain, and Parmentier, the agriculturist, who introduced the cultivation of the potato into France, prepared the official report.

"Even then it was recognised that bolting the white flour was injurious and did not constitute a substantial aliment for the soldier."

Balland, quoting from this ancient report, says:

" 'What is good for the soldier is good for every man who is engaged in active physical work and who needs thoroughly nourishing food. The bread so universally employed to-day is made of the central parts of the grain which are the least rich in the color of the bread.' "

Supplementing Balland's warning Michel Levy, and Begin, army official inspectors, declared:

"Bolting eliminates the useful elements of flour in more than one respect and has no other compensation than an improvement in the color of the bread.

"What the white bread lacks in nutrition has to be made up by an increased consumption of other foods containing the missing elements. This fact is brought out very clearly in the reports of the food supply furnished by the French army.

"The use of white bread enormously increases the consumption of meat, which, when pushed beyond the limits of normal toleration, is followed by many physical derangements as grave as those which result from the mineral deficiency of refined cereals."

Never before has any case been made in behalf of public health in which the evidence has been so overwhelming or so

conclusive. Yet, if we may be permitted the phrase, "the worst is still to come."

§ 40—RICE, SCOURED AND POLISHED

Few Americans have ever eaten rice as nature intended them to eat it. The beautiful grain, midway between cream colour and light brown in hue, with a flavour that the polished rice eater has never tasted, has been banished from the United States for many years.

The robbed substitute is the brushed, scoured, polished, and sometimes talcum coated grain of commerce, so degraded and denatured by the milling processes through which it passes that when fed to the fowls of the barnyard it brings about their death in seven weeks.

Fed on the natural, unrefined grain containing all the elements with which nature has endowed it, the creatures of the barnyard thrive indefinitely.

The "innocent" bowl of rice, as we now scour and polish it, served to the growing child and the convalescent struggling desperately upward out of an abyss of distress, will not support human life. We have robbed it as we rob the wheat.

No, this is not the cry of an alarmist. Behold the facts.

In the Philippine Islands a disease called acidosis, or beri-beri, has wiped away countless thousands.

We have similar diseases in the United States, but we call them inanition, anemia, neurasthenia, nervous prostration, general breakdown.

Beri-beri, or acidosis, journeys from one stage to another, through all of these experiences. Its name neither adds to nor detracts from its ability to destroy. Those who encounter it die the death.

Dr. V. G. Heiser in the year 1910, then director of health of the Philippine Islands, Dr. Fraser of Singapore, Dr. Aaron of the Philippine Medical School, Dr. Highet of Siam, and Dr. DeHaan of Java, produced evidence that showed conclusively that

acidosis, or beri-beri, is caused by a diet of polished rice, such as is consumed in the United States.

As early as 1905 Dr. Donald McCaskey had noted the ravages which follow a diet of polished rice.

Polished rice does not introduce some mysterious germ into the body. It simply starves the blood and tissues until they no longer offer a defence to any germ.

With resistance broken and immunity destroyed, as the result of inadequate nourishment, pathogenic organisms take up their residence in the weakened tissues of the body, and grow and multiply until disorder ensues.

During January and February, 1910, another of the many outbreaks of acidosis among the inmates of the Coulion Leper Colony aroused the interest of the little group of physicians named above.

The disease resisted all medical treatment. It was noted that the lepers were striving to maintain life upon a diet of polished rice. As an experiment the polished rice was discontinued and the natural grain substituted.

The sick in the hospital were fed with the rice polishings that had been removed from the refined grain. Rice polishings are the outer layers of the rice that give to the grain its light creamish brown colour. Underneath, the grain is snow white.

This snow whiteness consists principally of starch; the polishings contain the phosphorus compounds and other mineral salts, ferments, vitamines, and nitrogenous products brushed, scoured, and polished away to make the grain pleasing to the delicate eyes of pale women and children.

On a sixty days' diet of the natural grain, to which the rice polishings had been added, the spread of the disease was interrupted and complete cures established. Yet, not one of the 400,000 children under ten years of age who died in the United States that year could find a pound of that natural brown rice in all the land.

Still the medical profession needed more evidence than this to convince it that when man denatures his food by refining processes he destroys its ability to confer upon him immunity to disease.

So Dr. Fraser of the Straits Settlements and Dr. Aaron of the

Philippine Medical School set about to prove that when man brushes, scours and polishes away the phosphorus compounds and other organic minerals present in the pericarp of natural brown rice he robs the human family of its requisite supply of these elements.

After this fact had been demonstrated to the satisfaction of the physicians in the Far East it was again experimentally confirmed in chickens and later in human beings.

Finally two groups of railway workers in the Straits Settlements were employed as a poison squad. The group of men that partook of polished white Siam rice of best quality developed beri-beri within a period of approximately sixty days, while the group that partook of the unpolished rice remained free of the disease.

§ 41—NATURAL BROWN RICE

In feeding the two groups of railway workers in the Straits Settlements, one group received polished white Siam rice, the other group natural whole rice of the same kind.

Every effort was made by interchange of clothing, by personal contact and by living in the same house to convey the disease to the group that ate of the natural rice. Not a single case developed. The process was then reversed.

The group that partook of the polished rice was put upon a diet of natural rice, and vice versa. Within sixty days the refined rice eaters developed beri-beri, although they had remained immune to the disease as long as they ate the natural, whole, unrefined rice.

The results of these experiments were then confirmed in Manila by the use of rice polishings in the treatment of acidosis, the victims of which showed immediate improvement in their condition.

A recommendation was then made to the Governor-General of the Philippine Islands, urging him to forbid the use of polished rice in all public institutions.

In the quarterly report of the Bureau of Health of the Philippine Islands for the first quarter, 1910, appeared this statement:

"It is hoped by this means not only to eradicate the disease from such places, but also that it may serve as an educational factor in disseminating knowledge as to the method by which such disease may be avoided."

The Governor-General, June 3, 1910, issued an executive order to all health officers and presidents throughout the Islands, forbidding the use of polished white rice in all United States Government workshops, prisons, hospitals and other institutions. Thus it was determined that polished rice was bad food in the Philippines, although elsewhere in the United States people could eat it as they wished.

October 22, 1910, I received a communication from Dr. Harvey W. Wiley, then chief of the Bureau of Chemistry, Washington, D. C.

Dr. Wiley, as you know, was forced to resign from the government service because of his courage in pursuing food frauds. His activities were becoming a menace to many commercial institutions. These institutions found able agents to thwart his efforts.

He said in his letter to me: "We should not even in a small way permit a condition of nutrition favouring the development of any disease due to the debasement of rice. Rice is becoming a more general diet in this country, and the dealer who first begins the campaign for pure unadulterated rice will promote the cause in a commercial way that will do much toward protecting the health of the people."

Upon the receipt of Dr. Wiley's letter Francis H. Leggett & Company, a wholesale grocery house with which I was then connected, decided to restore whole natural rice to the people.

It was evident to Theodore F. Whitmarsh, vice-president and general manager of the institution, also president of the National Wholesale Grocers' Association, that physiologists were beginning to recognise that the discarded substances of refined foods were essential to the health and well-being of man.

He saw that any commercial effort to keep pace with these scientific discoveries promised to prove a good business policy.

I called to his attention and the attention of his associates the comments of Dr. Alexander Bryce of Birmingham, England, and the experiments of Schauman.

Bryce had said: "It is probable that a daily supply of the

different compounds of organic phosphorus is necessary in the food, as no proof exists to show that the nucleins, lecithins or phytins are capable of being substituted one for the other."

Schauman had proved that pearled barley and white wheat flour not only induce disease among men, but among fowls.

Whitmarsh determined to make whole natural rice a feature of his business, together with whole wheat meal and old-fashioned oat meal. Arrangements were made with Texas millers for a supply of high-grade whole rice.

This rice was packed in one-pound cartons, and I was instructed to find a name for it. I labelled it "Premier Natural Brown Rice."

Several thousand dollars were spent in those early days by Francis H. Leggett & Company in an effort to exploit the virtues of this rice. Notwithstanding the reform it represented and its marked superiority in flavour and nutritional value, the product was finally sold as chicken food at a loss.

The people were slow at that time to respond, and their indifference discouraged Whitmarsh as to the commercial possibilities involved in any effort to popularise honest food.

In 1917 he became Herbert Hoover's chief aid in the Food Administration, but although I consulted with him in person and deluged him with letters, he believed it expedient to avoid the subject as a war measure, advising me that "the Food Administration could not undertake to educate the people."

Whitmarsh thus lost the opportunity of an age to become the greatest living benefactor of mankind. Had the Food Administration emphasised the scientific truths at hand, the entire world, under the pressure which the Hoover organisation showed it could apply in other and less important directions, would now be profiting by them.

§ 42—A SPOONFUL OF GRAVY

In 1905 Dr. Donald McCaskey was medical inspector in charge of a company of Igorot soldiers in Buena Vista, Cavite Province, Philippine Islands. The soldiers all went down with acidosis,

or beri-beri; all complained of palpitation of the heart, shortness of breath, pains in the nerves, flabbiness of tissue, emaciation, and puffy swelling of the limbs. Remember these symptoms for you will see them again under wonderful circumstances. The disease ended ultimately in paralysis and death.

When McCaskey was put in charge of these troops he noted they had been eating the usual Philippine ration of rice, which, however, had been polished in imitation of the American custom.

McCaskey was familiar with outbreaks of beri-beri that had swept like wildfire among the Japanese troops during the Russo-Japanese war, and he knew that it had been observed at that time that such troops as were fed with unpolished rice were not subject to beri-beri.

Numerous drugs had been employed on the Igorot soldiers, but as they did not bring relief McCaskey put them on a diet of unpolished rice. These are his words:

"The results were so astounding that inside of six weeks the beri-beri sufferers had recovered sufficiently to take the trail and hike on their own legs fifteen miles to Manila."

Later the convictions borne of this Manila experience were further confirmed by his study of beri-beri in the Japanese hospitals at Hiroshime, Tokio, Kobe, and Sasebo.

Surgeon-General Takaki of the Japanese navy was made a baron in recognition of his discovery that beri-beri, prevalent among Japanese soldiers and sailors, was not of bacterial but of dietetic origin, "due to the loss of certain food constituents, notably phosphorus, contained in the inner coating or pericarp of the rice grain, which is always removed and discarded in the preparation of polished rice."

Chamberlain and Vedder of the United States Army Board for the Study of Tropical Diseases, after studying the very high mortality of breast-fed infants in the Philippine Islands, reported that "these infants recovered from nervous diseases of dietetic origin with remarkable rapidity under treatment with an extract of rice polishings." This extract contains phosphorus, iron, calcium, potassium, and many other bodies of unknown nature discarded in the modern process of milling rice to give it a white and fancy appearance.

Vedder, with Strong and Cowell of Manila, experimented with

a rice diet in Billibid prison, the hygienic conditions of which are reported as almost ideal.

The result of their experiments has been briefly summarised in the following words:

"It has been generally admitted that the higher the phosphorus content of rice the less is the possibility of that rice to produce beri-beri.

"Fraser and Stanton found as an average result in all their examinations that unpolished rice contains 0.540 per cent. of phosphorus pentoxide.

"Aaron found an almost identical quantity, his figures being 0.557 per cent.

"We therefore emphasise the necessity of carefully considering the question of the amount of phosphorus pentoxide which rice should legally be required to contain in order for it to be regarded as an unpolished rice exempt from taxation in the Philippine Islands."

All these investigators have clearly established the fact that refined foods are inadequate to the needs of the living animal.

Some of them, however, have gone into confusing and dangerous fields.

"Give us enough 'phosphorus pentoxide' and we shall be safe," concludes one group.

"Give us enough 'potash' and everybody will be safe," says another group.

"Give us the 'vitamines' and our food, of whatever it may consist, will be sufficient to our needs," declares another group.

Another group tells us that "if we consume sufficient 'calories' we need have no other worries."

"A spoonful of gravy is all that is necessary to supply the offsetting elements missing in white bread and other refined foods," says Dr. Woods Hutchinson.

None of these commentators seems to realise that it is not any one of the elements of known or unknown nature to be found in natural food, however important in itself, but rather the combination of all of them which is essential to health and longevity.

Short time experiments with any one of them or with the absence of any one of them or with any arbitrary combination of

some of them cannot yield results which will serve as a standard for an entire lifetime.

§ 43—MEDICINES ADDED TO SUGAR AND STARCH

It is not the phosphorus lost in the milling of wheat, the polishing of rice, the pearling of barley, or the degerminating of corn which explains the inadequacy of such refined and denatured foods when consumed by man or animal.

Commenting on the phosphorus content of unpolished rice as an index of its fitness for food, Chamberlain states:

"The determination of any other element which is chiefly contained in the pericarp, such as potassium, iron, calcium, etc., would be an equally good index of the safety of the rice."

In other words, the food factory cannot remove any one element from the cereals prepared by it without also removing all of the other elements. They are so intimately bound up with each other that when one goes all go.

To over-emphasise the importance of ferments or vitamines or any one of the mineral salts is to cloud the whole issue of metabolism in mystery and darkness. One might as well over-emphasise iodine and ignore the vitamines as to over-emphasise the vitamines and ignore iodine.

We have already seen something of the thyroid gland and have learned that in health its iodine content is much higher than in disease.

The manner in which iodine, so completely removed from bread, biscuits, cakes, crackers, cookies, breakfast foods, cornmeal, pearled barley, rye flour, polished rice, pancakes, glucose, table syrup, sugar, candy, etc., influences the metabolism of other indispensable bodies is vaguely hinted at through the experiments of A. I. Ushenko.

Ushenko found that "following thyroidectomy (which means the removal of the thyroid gland) the percentage relation of phosphorus to nitrogen in the urine is first increased but then again is strangely diminished before death.

"The amido acids and purin bodies are increased while creatinin is diminished. The metabolism of the tissues containing phosphorus and nitrogen is acutely disturbed, the synthetic processes being mostly affected."

Here we behold the removal of an iodine-secreting gland affecting disastrously the interrelations of other parts of the body and modifying at once the nature and proportion of elements secreted and excreted by those other glands. Iodine in itself will not support life. Its combination with other elements is essential.

Chamberlain declares that Schaumann's assumption that it is a phosphorous compound which prevents polyneuritis is not correct.

"A large number of substances," he says, "have been shown to be of no value in the prevention of polyneuritis. Among these may be mentioned potassium, chloride, phosphoric acid, either singly or combined, potassium phosphate, either acetate or carbonate, magnesium phosphate, lipoids of the lecithin group, nitrogen compounds, such as histidin, asparagin, and various amino acids (elaborated in the digestion of meat, eggs, cheese, etc.), potassium iodide, thyroid extracts, Romann's salt mixture, cottonseed oil, egg albumen, or any combination of these substances."

The failure of vitamines, when consumed without the assistance of the other food elements necessary to normal nutrition, to perform the miracle of sustaining normal life and health requires little demonstration.

These vitamines, some of which, isolated by Casimir Funk, are complicated chemical compounds, occur as colourless needle-shaped crystals with a melting point of 451 degrees Fahrenheit. When added to a diet of sugary and starchy foods they will not maintain life, although sugar and starch are rated among the very highest of the "high calorie" foods, and therefore are looked upon by mistaken scientists as the most important of all foods.

In fact, however high the calories, or however abundant the vitamines, unless the other food elements, so wantonly destroyed by food refinement, are present the body cannot make proper use of them.

The experiments of Voegtlin and Towels with foods of "high calorie" value deprived of their mineral content demonstrate the inadequacy of the calorie theory.

These investigators found that "an aqueous extract of autolysed spinal cord from which the coagulable protein has been removed contains vitamines or anti-neuritic substances which cure symptoms of polyneuritis in birds fed on polished rice when administered in daily doses corresponding to four grams of dried cord.

"These vitamines or anti-neuritic substances, when added to a diet of polished rice, seem capable of removing some of the nervous symptoms of disease, but fail absolutely to establish normal metabolism and the affected birds do not recover."

This is known. The simplest of natural foods contain all the mysterious physiologically active principles required to maintain normal health. Still we find scientists blindly rummaging through fields of experimental darkness seeking complicated and high-sounding explanations for phenomena so humble on the surface and so majestic at the core that they have defied all the cross-examinations, all the probings, all the analyses, and all the theories of man.

The grain of wheat simply asks to be let alone. The other cereals cry out to humanity, "We are sufficient in ourselves; do not change our nature, do not undervalue our functions, do not manipulate our attributes, do not destroy those potent forces we have brought forth from the earth for the food of man."

In vain shall we seek for peace while we are at war with the laws of God. Scientific phrases are not substitutes for the laws of life, howsoever they may contribute to the vain glory of the eminent members of that august inner circle of established reputations whose mighty wisdom, ignoring the simplest laws of life, clashes with the all-sufficient but hidden purposes of the Creator.

The shadow cannot ignore the substance; the dream cannot ignore the reality; the reflection cannot ignore the flame. The lore of the libraries cannot ignore the miracle found in a drop of milk or a grain of wheat.

Real science, in all the humility of true greatness, suggests in what it is doing for the welfare of the world an image of the divine, but the semi-scientific confusion which has complicated the dietary of nations is but a modern Babel.

§ 44—BASES AND ACIDS IN FOOD

Every housewife is familiar with the bubbling and effervescing which follow the mixing of baking powder ingredients. Cream of tartar and baking soda or baking soda and molasses, when brought together in the presence of moisture, froth and bubble. The bubbling is due to the elaboration of a gas which was originally part of the baking soda bound up in it by chemical bonds. Breaking of these bonds by the acid action of the cream of tartar or molasses sets the gas free, which is thus allowed to escape through the mixture to be raised during the baking process.

Baking soda is alkaline; cream of tartar and molasses are acid. Alkaline substances are at war with acids. When they come together they fight it out until both become neutral. After the fight there is neither alkali nor acid present. When neutralised by each other nothing is left but neutral salts.

The alkalis are called "bases," possibly because they establish a base for the operation of the acids. Some acids are feeble, others are highly energetic. Lactic acid is one of the feeble acids; sulphuric acid is one of the energetic acids. Both, however, are neutralised by bases. So are all other acids.

It is necessary to understand this because acids and bases are neutralising each other in the body during every moment of life.

When the acids manufactured in the body, such as lactic acid, uric acid, carbonic acid, phosphoric acid, sulphuric acid, and many amino acids, are allowed to remain unneutralised through some failure of life's processes they attack the tissues, thus producing the result known as acidosis. Acidosis is the curse of all refined food eaters.

This is so because all refined foods are of the acid-producing type. The condition known as acidosis may be feeble or it may be extremely violent. Between the two extremes it can register a hundred degrees of intensity, each of which is given a different name by the diagnostician, depending entirely upon the organ or gland of the body mostly affected.

In beri-beri, pellagra, rheumatism, tuberculosis, neuritis, nerv-

ous prostration, anemia, and many other disorders, acidosis is always present. This means that the acids which develop in the body as the result of the processes of digestion and assimilation, have not been neutralised. The bases that ought to be present to do their work have been thrown away.

The living cells, tissues and nerves which, in health, are bathed in the alkaline fluids natural to them, now become saturated with irritating acid secretions which stimulate them to do all sorts of unnatural things and which if unchecked actually bring about their destruction.

All this has so much to do with beri-beri, tuberculosis, rheumatism, anæmia, pellagra, malnutrition, neuritis, nervous prostration, and many other diseases that we must begin to appreciate the destroying nature of acidosis and how it is brought about.

We have seen that the function of the food minerals, many of which, let it be noted, are bases, are:

1. To regulate the specific gravity of the blood and other internal secretions of the body.

2. To regulate the chemical reactions of the blood and other internal secretions and excretions.

3. To preserve the tissues from disorganisation and putrefaction.

4. To enter into the permanent composition of certain structures, especially the bones, teeth, and tissues.

5. To enable the blood to hold certain materials in solution and to assist in their appropriation to the needs of the body.

6. To serve special purposes, such, for example, as the influence of chlorine on hydrochloric acid formation, the influence of calcium in favouring coagulation of the blood; the influence of iron in the formation of blood pigment, the influence of potassium on the elasticity of the tissues, etc.

Notwithstanding the relationship of food minerals to the phenomena of life, there is not one table of calorie values now published in the United States which does not ignore the mineral division of foods. All these tables confine their information to three heads—the so-called life preservers, "proteins," "carbohydrates," and "fats."

Now, all proteins and carbohydrates are acid-forming foods. When consumed without their corresponding bases they grad-

ually bring about a condition of acidosis which prepares the way for the development of many diseases.

There is much evidence to indicate that it is the development of acidosis in the body which destroys the body's natural immunity to disease. Proteins and carbohydrates are typical high calorie foods. All the scientists are talking about calories. The dietitians base all their tables and formulas upon these calories. Every hospital and sanatorium in the country talks glibly of calories. All of them see to it that this or that invalid or convalescent receives a certain number of calories every day, and the foods are selected, as a rule, according to a table, depending entirely upon their record as calorie producers. It is the failure of the calorie that we are now to consider in order that we may grasp the dangers of acidosis and how to guard against them.

§ 45—CALORIES AND "SCIENCE"

Men are still alive who recall the days when horseshoes, nailed over the barn door, were looked upon as a cure-all for disease and a preventive of evils. Where the horseshoe hung lightning would not strike; the horse would not get glanders. A few people still believe in the efficacy of horseshoes.

Other men recall the days when buckeyes were the greatest friends of the human race. There was an old adage that ran like this: "Carry a buckeye in your hip pocket and you will escape rheumatism, or if you get it the buckeye will cure you." A few people still cling to the buckeye superstition, but scientific men laugh derisively at the absurd faith of their humbler brothers in horseshoes and buckeyes.

These scientific men, who so clearly see the mote of superstition in the eye of the great unwashed, do not see the beam in their own aristocratic orbs.

They are now giving lectures on "calories." They write about "calories." The Government publishes bulletins on "calories." Hospitals and sanitaria, that ought to know better, compose "scientific" diet lists for the guidance of invalid and convalescent

and in all these lists the "calorie" assumes an importance that horseshoe or buckeye never enjoyed.

Professional nurses are talking about the "calorie" theory and some of them collect fees for their familiarity with it.

Even restaurants have fallen under the spell and are imitating the scientific leaders of thought who look down from lofty pinnacles of wisdom and smile indulgently as they witness the spread of the silliest fetish that ever cursed the medical world.

On the 1918 bill-of-fare of one of the largest systems of restaurants in the world, with establishments in New York, Brooklyn, Newark, Philadelphia, Pittsburgh, Boston, Chicago, Montreal, Toronto, Buffalo, Syracuse, Providence, New Haven, Paterson, Atlantic City, Baltimore, Washington, Norfolk, Atlanta, New Orleans, Memphis, Jacksonville, Louisville, Cincinnati, Cleveland, Minneapolis, St. Paul, Kansas City, Denver and Los Angeles, is published the following:

"Figures in parentheses indicate calories as computed by an expert in nutrition. These show the energy value of the different food items and will permit customers to conserve food by ordering scientifically."

Let us separate the calorie scientist from the horseshoe farmer or the buckeye bricklayer.

In the first place we must find out what a "calorie" is and then we must show conclusively that it is the easiest thing in the world to condemn a man to death while stuffing him with the fattest calories found in the grocery store.

A calorie is a unit of measure. It has the same relation to heat measurement as the inch bears to the yardstick or the ounce to the ordinary balance.

If twenty drops of water are so heated that their temperature goes up one degree the amount of heat required to send the mercury up in the thermometer to this extent is said to be a calorie.

The scientists, speaking of twenty drops of water, describe this quantity as a gram. It can thus be seen that the heat required to raise the temperature of one gram of water two degrees is two calories and that if two grams of water are raised two degrees it takes four calories to do the trick.

After Barnes, by experimenting in his laboratory, had estab-

lished the principle that the relation of heat to energy could be expressed with the accuracy and precision of mathematics, he was able to prove that if one calorie of heat is produced in a steam engine enough energy can be obtained therefrom to lift a load of three pounds from the ground one foot in the air.

A certain beautiful truth lies at the heart of this discovery. But as it is now applied to the food requirements of man it has become distorted, ridiculous, grotesque.

The scientists have invented a contrivance which they call the "bomb calorimeter" in which they burn up olive oil, kerosene, butter, engine oil, bread, gasoline, turnips, benzine, soup, dynamite, white bread, fire-wood, cheese, anthracite, or any other combustible matter under investigation for the purpose of determining its caloric value. Though there are two kinds of calories, the large and the small, we shall employ the term merely as a unit of heat measurement.

Inasmuch as the physical energy of the body necessary for its tissue activities can come only from food, an article of diet that can send the mercury in the thermometer of the calorimeter soaring to the breaking point must be full of possibilities as a source of body energy. Thus do the caloricians reason.

These scientists, while laughing at horseshoes and buckeyes, have attached so much importance to this idea that they completely overlook the fact that food, to be burned in a body in the production of calories, is dependent upon the condition of the body to do the burning.

They have also lost sight of the fact that most of the heat which results from the burning of food in the body goes to maintain the normal temperature of the body and that where health is impaired through faulty nutrition no number of calories, however large, can avail anything.

These same scientists, in their intense enthusiasm for the rule of calories, ignore the fact that the most deficient and worthless of all foods are those which strangely enough possess the highest caloric value.

It never occurs to them that calories cannot and do not put iron into the red colouring matter of the blood; that calories have nothing to do with the oxidising-agent, manganese, which keeps company with the iron of the blood.

It never occurs to them that calories have nothing to do with the building of a protecting shell of fluorides around the bone structure of the teeth or that calories have nothing to do with providing the bone structure with calcium and phosphorus.

It never occurs to them that calories do not neutralise the acidity of the tissues or preserve the normal alkalinity of the blood and other internal secretions.

It never occurs to them that calories, however abundant, cannot act as a substitute for sodium, magnesium or sulphur in the body, or that calories cannot take the place of potassium or any of the other mineral salts and colloids which assist in the control of the processes of assimilation and elimination.

It never occurs to these scientists that with normal blood, teeth that can grind food, tissues in healthy condition and glands that are performing their functions normally, the human body is capable of availing itself of the energy bound up in normal foods, technically expressed as calories, even though the average person never heard of one.

It is because of these facts and others of still greater significance that the superstition of caloric feeding has persisted at the bedside, in the hospital and in the sanitarium until there is now no one who can estimate the number of men, women and children who have died as a result of this scientific superstition.

It may be an interesting scientific achievement to determine the number of calories elaborated in the body by the digestion of 240 grams of bread, 31 grams of butter, 120 grams of steak and 44 grams of prunes.

Perhaps it is also an achievement to determine that smoked bacon contains 10.5 per cent. protein, 64.8 per cent. fat, 0.00 per cent. carbohydrates, with a fuel value per pound of 2,841 calories or 100 calories per gram.

With such a table, containing the calorie value of all the foods on the calendar, the dietitian can devise a theoretical formula of feeding which should contain a guarantee of uneventful convalescence for the sick and an assurance of perpetual well-being for the healthy.

Unfortunately for its victims the calorie theory ignores the fact that no food, regardless of its calorie value, is burned in a dead body and that no food can liberate its calories according to

the calorie formula unless the organs of the body are actively performing their proper functions.

The failure of the calorie theory and the superstitions which flow from its abuse are traceable to the lopsided importance attached by scientists to a mere detail of the miracle of nutrition, while ignoring in their calorie enthusiasm the significance of those wonderful substances upon which life depends—the salts, colloids, enzymes, ferments and vitamines of food.

The calorie scientists do not consider the fact that foods are refined every day to a degree that removes and destroys these salts, colloids, enzymes, ferments and vitamines without changing one particle the calorie value of what is left.

Thus they ignore the growth-promoting substances of foods which have no calorie value and those other substances of food which, absolutely worthless from the calorie standpoint, are nevertheless indispensable to the regulation of the specific gravity of the blood, to the regulation of the chemical reaction of all the internal secretions, to the preservation of the tissues from disorganisation and decomposition, to the composition of the solid structure of the body, to the ability of the blood to hold certain materials in solution.

T. B. Osborne and L. B. Mendell found that animals fed with mixtures of refined protein, refined sugar, starch and fat, which have a greater calorie value than all other foods, even when mixed with inorganic matter in the form of crystallised salts, declined rapidly in health.

The elements essential to health were found under these feeding experiments in milk whey. Milk whey has absolutely no calorie value whatsoever. Yet when milk whey was added to these refined foods the decline of the health of the animals was arrested.

Milk whey contains none of the proteins or fats of milk. It is the clear watery fluid which contains only the organic salts of calcium, iron, potassium, phosphorus, etc., and some of the growth-promoting substances found in milk.

Milk whey might be called clear soup for chemically it resembles clear soup more than any other food now known to man, but it is as ignorant of calories as sugar, in all its calorie fulness, is ignorant of life-sustaining properties.

Man can manufacture sugar from starch but God has withheld from him the secret of making whey or of substituting for it.

The U. S. Bureau of Standards, through the irritation of some of its Ph.D. ornaments, will attack this iconoclastic "nonsense" but it will not publicly criticise the data developed by other government bureaus. One recalls how the Ph.D.'s of his time attacked the glorious Pasteur. They were on the government payrolls of France and Germany. Now they are dead and Pasteur, resplendent, remains the foremost scientist of all time.

§ 46—CALORIES AND GASOLINE

Clear soups have practically no caloric value. In the restaurant table referred to a bowl of vegetable soup, which is very thick soup, is given a value of 200 calories, whereas a bowl of oyster stew is given a value of 630 calories.

Clear soup is even less rich in calories than watermelon, a whole pound of which has a caloric value of but 50. Clear soup is less rich in calories than apples, a whole pound of which yields but 190 calories.

Some foods have practically no caloric value at all as compared with oleomargarine (3410 calories), salt pork (3555 calories), granulated sugar (1750 calories), refined corn-meal (1635 calories), white bread (1200 calories).

These low calorie foods, ranging in value from 200 calories per pound down to almost nothing, include skimmed milk (165 calories), buttermilk (160 calories), string beans (170 calories), potatoes (160 calories), cabbage (115 calories), celery (65 calories), cucumbers (65 calories), lettuce (65 calories), onions (190 calories), rhubarb (60 calories), spinach (95 calories), tomatoes (100 calories), turnips (120 calories), lemons (125 calories), oranges (150 calories), and strawberries (150 calories).

Now the Big Superstition involved in the calorie theory makes its appearance.

When refined foods, which have a caloric value so high up in the scale that they are measured by the thousands as con-

trasted with other foods measured on the scale under the two hundred mark, are fed to animals, the animals die.

If we feed these high calorie foods, such as corn-starch, granulated sugar, corn syrup, corn grits, corn flakes, cream of wheat, polished rice, tapioca, macaroni, white flour and puffed rice to animals they die.

If fresh vegetable juices that have no caloric value at all are added to these refined foods the animals will live, but they will not gain their normal weight, their strength or their resistance to disease.

Their complete recovery cannot be brought about until they are fed with unrefined foods including the parts of the grains rejected in the milling of patent flour, degerminated corn-meal and polished rice or the substances found in the leaves of plants, such as lettuce, cabbage, celery tops, spinach, etc., or in the butter fat of milk and in the germ of wheat, rye, oats, corn and rice.

When these cast-off substances, ridiculously deficient under the rule of calories, are restored to the diet of the animals they at once regain their weight and all their vigour.

The most important and interesting discoveries concerning the growth-promoting substances called vitamines, not found at all in the high calorie foods so abundant in America and so enthusiastically recommended for hospital and sanitarium use, have been made during the last three years.

These discoveries show that in milk, in the seeds of grasses and in the grasses themselves exist two substances which have no caloric value but which stimulate and control the development of children and contribute to the vitality of adults.

One of these substances as we have seen is found in the fat of the food and the other in the juice of the food. Their chemical character is unknown and they have never been separated from the food materials with which they are associated.

McCollum shows that they are most abundant in cabbage, lettuce, spinach, cauliflower and milk, all of which, in the calorie scale of values, are away down at the bottom.

In experiments, McCollum, with Osborne and Mendell, has shown that the feeding of butter fat and whole milk promotes growth in a remarkable way and that no matter what the calorie

value of the food may be, if these substances, that have no caloric value at all, are not present, the development of the animal will be stunted and its health impaired.

We know that engine oil, kerosene, gasoline and benzine have a higher caloric value than alcohol.

We know that alcohol has a higher caloric value than sugar.

The calorie scientists, therefore, ought to refine the stench out of engine oil, kerosene, gasoline and benzine as they refine the stench out of cotton-seed oil. Odourless and tasteless gasoline, having a much higher caloric value than alcohol or sugar, could then be put into soup.

The addition of a teaspoonful of gasoline to a bowl of soup would contribute all the calories the professors declare so essential to life.

Sugar in war is almost priceless and the average man ought to be content, therefore, to put his little Ford in storage so that the gasoline thus saved might be used to keep his children in health if only some inventive genius would come along and remove its objectionable jitney flavour.

A speedometer, however perfect in its ability to register the number of miles travelled, will get a chauffeur nowhere unless accompanied by an automobile.

A complete set of horseshoes without a horse is of little use to a driver.

The hands of a watch will throw no light on A. M. or P. M. unless attached to an efficient timepiece.

If a convention of scientists assembled for the purpose of emphasising the overshadowing importance of speedometers and horseshoes as a means of locomotion or of watch hands as the controlling factors in our system of measuring the duration of heatless, meatless and sweetless days, the obvious folly of their conduct would make them ridiculous before the world. One might as well attribute the velocity of Niagara's fall to the speed of the turbines whirling at its side.

Yet, in tying their blue ribbons about the neck of the calorie and setting the poor thing on a pedestal of glory as the very heart and essence of scientific feeding, they have attempted to dignify the ludicrous, a feat heretofore never accomplished.

Those complex substances called proteins are found in food and are parts of food. The calorie is not found in food and it is not a part of food.

The carbohydrates (sugar and starches) are found in food and are parts of food. The calorie remains still a name and is no part of protein, sugar or starch.

The fats, including those complex compounds known as lecithins, are found in food and are parts of food. The calorie has nothing to do with phosphorised fats, with palmitin, olein or stearine, all of which are found in foods and are parts of food.

The ash content of foods is present in all foods except refined foods. The ash content when removed in sifting, bolting, polishing, scouring, desiccating and refining carries with it all the salts upon which life depends, all the vitamines which control growth and development, and all the biochemic substances which confer upon the body in health its natural immunity to disease.

The calorie is nowhere found among these substances. Yet in all the learned treatises on calories no mention is ever made of any of these food elements found in ash.

One might point to a hat or a necktie and say, "There stands a statesman," and be quite as accurate in his comment as is the scientist who points to a calorie and says, "There flows the fountain of youth." The hat and the necktie at least have existence.

Just how the calorie, merely a notch on a yardstick, has succeeded in appropriating the centre of the universe will probably never be known, for as its shameless record of pretence begins little by little to dawn upon the minds of the unwary, those who have stood by so faithfully with the aid of big but meaningless words will begin their flight into darkness even as rats abandon a sinking ship.

In the treatment of disease the calorie can be made to serve a noble end but not until those who consult its meaning include in their efforts a conscious recognition of the indispensable substances it now ignores.

§ 47—ACID FORMERS AND FEMALES

Sherman and Mettler reported in May, 1912, as a result of experiments conducted in the laboratories of Columbia University, their estimate of the acid and base-forming elements in the ash of the mineral content of forty-seven different kinds of food.

Meats, including fish, showed a decided preponderance of acid-forming elements. The lean flesh of different species, whether of young or mature animals of the same species, showed similar results.

The white of eggs was found to be an acid-former. Milk, on the contrary, showed a slight preponderance of base-forming elements. Vegetables and fruits showed a marked predominance of base-forming elements.

Experiments of several days' duration upon healthy men showed that where foods with a preponderance of acid-forming elements were substituted for foods with base-forming elements the increase of ammonia excretion in the urine accounted only for one-fourth to one-third of the acid involved.

The sulphates and phosphates in the urine, evidences of the fact that the sulphuric and phosphoric acids elaborated in the body had been neutralised, as they should have been, were not considered.

Sherman and Mettler did succeed, however, in stampeding self-satisfied scientists.

It has never occurred to these scientists that white bread, biscuits, crackers, farina, refined breakfast foods, pearled barley, corn meal, corn flakes, cornstarch, polished rice, mashed potatoes and refined cereals and sugars of every kind are acid formers, and that their constant appearance on the tables of the nation is rapidly bringing about a national condition of acidosis.

Barr declares: "Rheumatoid arthritis is not due to the action of bacteria or their toxines or of the toxines developed in the intestines as a result of stasis. The cause is a mild chronic acidosis which extracts the lime salts from the fibrous tissues, muscles, nerves, cartilages, and bones. The extraction of lime

salts from fibrous tissues causes it to swell and its vascularity to increase.

"Loss of lime salts causes irritable weakness of the muscles. Under such a loss the muscles waste and contract readily. They frequently cramp and deep reflexes are exaggerated, often accompanied by rhythmic tremor. Neuralgic pains result from the extraction of some of the very small amount of lime present in the nerve tissue. With the continued absorption of the lime the particular tissues swell and there is effusion into the joints.

"The cartilages soon become involved and this is followed by thinning and erosion. The lime and other bases are so necessary to the neutralisation of the acids elaborated by the acid-forming foods that they surrender themselves to the actual destruction of bones and tissues in order that as long as possible the unnatural condition may be tolerable. Even when all the bases are withdrawn from our food the phosphates and sulphates continue to appear in the urine, showing that the body has had to steal the alkaline bases from its own tissue in order to carry on life's processes. Surely no one is so blind as to assume that this stealing can go on continuously without encountering disaster.

"The fact that the disease is present chiefly among the poorer class and in the female sex between the ages of fifteen and thirty-five years lends support to this view," continues Barr, "for in these there is a deficiency of lime intake, and during the active menstrual period there is a tendency to an increased lime metabolism.

"The relative absence of lime and potassium in the refined food of the poorer classes leads to a deficient motility of the stomach, and this in turn results in obstinate constipation with acid fermentation.

"Apparently foods from which the lime and potassium are largely removed will not provide the intake of these substances necessary to normal metabolic processes."

Herman Hille says, "No vital process is possible without the presence of mineral constituents, as these elements and salts are generators of energy and are all equally important with protein, carbohydrates, fats, oxygen, and water, the great calorie producers. The human organism cannot exist without mineral

elements and salts in true organic form, as they are indispensable foods."

We begin to perceive the folly of removing the bases from all our prepared cereal foods and breadstuffs and from the vegetables cooked at home.

§ 48—SALT INTAKE AND OUTPUT

Herman Hille declares: "From a purely physical standpoint mineral starvation is usually the primary cause of disease. Organic minerals are more easily utilised than inorganic forms. Loss of mineral bodies impairs the food value of foodstuffs, and, moreover, tends to make them poisonous.

"Mineral starvation, regardless of the calorie value of the food ingested, is followed by disturbances in the vital processes and activities of the human organism, a reduced supply of vital energy, pollution of the blood, body juices and tissues, and the preparation of a tissue-soil in which parasites thrive and multiply without hindrance. Applying these facts and conclusions, we find that the food minerals can no longer be ignored by rational therapeutics. A rational scientific estimation of the value of foodstuffs must include the mineral bodies."

These statements were made in Chicago, Nov. 7, 1913, at the fifth annual meeting of the American Association of Clinical Research, in which body it is my privilege to enjoy membership.

Five years have passed since that memorable meeting, yet so slow-moving is truth that no scientific institute or hospital in America has to this day attempted to apply its life-saving principles.

With a hundred other investigators Gautier has demonstrated that sodium, phosphorus, potassium, lime, magnesium, iron, silicon, fluorine, chlorine, iodine, etc., are found in a constant manner in the residue left by the combustion of the animal organs, glands and internal secretions.

"These elements," he declares, "are absolutely indispensable to the life of the tissues. The system is constantly excreting them and, therefore, impoverishing itself by its excretions. It is, therefore, imperative that they should be found in sufficient quan-

tity and in assimilable forms in the different foods of man."

The French have not lacked warning to make them heed the folly of removing from their diet such physiologically active elements, the reactions and interactions of which control the biochemical processes of life.

The subject of mineral starvation, due to food refinement, is no new theme. Foster, in his experiments, established the fact that mice, pigeons, and dogs fed with meat which had been drained of its bases by the action of hot water, even if there is added to such meat, together or separately, starch, sugar, and fat, do not live beyond twenty to thirty days. Give them all the calories they require, but deprive them of the mineral matters natural to food, and these animals behave as though absolutely starved.

It should not be necessary to emphasise again the fact that the salts are necessary to the carrying on of life's processes, and that in such processes they are being constantly removed from the body.

Gourand has proved that these salts are excreted daily in health to the following extent:

Sodium chloride, 11 to 12 grams; phosphates, 4 to 5 grams; sulphates, 3 to 4 grams; calcium carbonates, .5 gram; magnesium, .2 centigram; potassium, .4 centigram; iron, .02 centigram.

From what source do we obtain them when they are removed from food?

Starling, corroborating the work of Foster, declares, "Animals fed upon demineralised or refined food rapidly show distaste for such food, become ill and die sooner than if they receive no food at all.

"It is therefore evident," he continues, "that the mineral constituents of food, although yielding no energy in themselves, are as necessary to the maintenance of life as the energy-yielding or calorie-yielding foodstuff."

§ 49—MATERNITY AND TUBERCULOSIS

The average physician, whether ordinarily interested in food or not, becomes peculiarly aroused during the gestation and lac-

tation period of his maternity patients, and the convalescent period of all his patients.

In the gestation period the fœtus acts as a mineral parasite. If the mother's diet at such a time is deficient in the vitamines, mineral salts and bases demanded by the developing embryo, the deficiency is made up at the expense of her own tissues, with a corresponding loss of vitality both for her and for her offspring.

Of all the tragedies due to the ignorance under which food is refined this is the most grim and depressing. The elaboration of milk during the lactation period without a proper supply of the food elements always found in normal milk, is followed by the same dismal consequences.

Here, during these two most sacred periods of woman's life, when the human heart goes out to the ministering mother in reverence, nature is actually asked to operate without the materials essential to the accomplishment of her purpose, and so she, who supports the heaviest burden of life, pays toll to folly in the form of preventable infirmity and pain.

Referring to the abstraction of calcium salts from the mother's blood by the fœtus as the cause of the rapid progress of tuberculosis, Drennin reports that "inasmuch as gestation and lactation both deprive the mother of lime salts, there is consequently less lime for the process of calcification of the tuberculous areas—nature's method of cure in tuberculosis.

"This, therefore, accounts for the frequent rapid rise of tuberculosis following maternity, increasing after every successive delivery, until the underfed mother generally succumbs after the third.

"During the re-establishment of functional activity following wasting disease, a deficiency of these compounders of life, the mineral salts, bases and vitamines of natural foods, means not only slow recovery but permanent injury, depending entirely upon the extent to which the refinement has been carried on."

Weston P. Chamberlain, Major Medical Corps, United States Army, cites the conclusions of Wellman, that the foods upon which prospective mothers, nursing mothers and convalescents are most frequently asked to subsist, such as starchy gruels, broths, farina porridges, polished rice, corn meal, tapioca pud-

ding, white toast and similar types of demineralised cereal foods, are inadequate.

Wellman reports that fowls fed by him developed polyneuritis on a diet of foods such as corn starch, Louisiana molasses, corn grits, cream of the wheat, boiled sweet potatoes, boiled Irish potatoes, sago, macaroni, white bread, biscuits, puffed rice, polished rice, corn flakes, pancake flour, etc.

In the case of sago, boiled potatoes and corn starch the symptoms of paralysis followed sooner than when the fowls were fed on raw, highly-milled rice, showing that the mere milling of rice itself is only one of many other food abuses which pave the way to disease.

In view of these facts, Wellman declares it is absurd to legislate in the United States against polished rice unless action is also taken against patent flour, pearled barley, refined rye, degerminated corn meal, corn starch, glucose, granulated sugar, etc., all of which are used even more freely in the diet of the American family than polished rice.

Wellman's findings in regard to white bread are of special interest in connection with Little's reports regarding the occurrence of progressive malnutrition in Labrador, among people who at certain seasons live extensively on white flour bread of the refined type, imported from Canada and United States.

Funk, referring to the many recent discoveries in regard to the importance of certain minute quantities of certain substances in the food, the lack of which entails disturbances in metabolism, says: "These special substances may be destroyed by leeching out and by boiling, by carrying desiccation too far, especially in food for cattle, and by discarding the outer cover of grains, especially rice, corn, wheat and rye."

The conclusions of Funk are elaborately confirmed by many experiences in the feeding of horses for vitality and strength, and the feeding of cows for milk production.

In an examination of a number of dairies in New York State, New Jersey, and several in Illinois, including dairies where certified milk was produced under the auspices of county medical societies, I found that cows improperly nourished continued to yield milk of poor quality until their tissues were exhausted, when they were shipped to uninspected slaughter houses, and

there killed and dressed for the retail butcher and bologna manufacturer.

Through the demands of lactation for an insufficient mineral food of assimilable nature, their tissues like the human tissues were actually consumed in milk production which brought about a condition of emaciation, anemia and impaired vitality favourable to the development of tuberculosis. The dairy cow suffers the same experience suffered by the human family, and for the same reason.

H. C. Sherman of Columbia University, commenting upon the calcium and vitamine necessities of man and beast, says:

"In the Orient where very little milk is available to the majority of the people, green vegetables, rich in calcium and vitamines, largely take its place."

Y. G. Chen, one of his oriental students, reports green vegetables are five times as prominent in China as in America.

"That children in the Orient," concludes Sherman, "fare as well as they do with a very low milk supply, as compared with America's supply, is explained by the much longer time during which they receive their mothers' milk.

"In China nursing is continued often for two full years, and not rarely for three full years. The child thus has ample time to become adjusted to the consumption of a variety of vegetable foods before its maternal milk supply is entirely cut off.

"It is not improbable," asserts Sherman, "that the free use of green vegetables with their high calcium and vitamine content in the food of the mother may be a factor in her ability to nurse her child through such a long period.

"This must be true because McCollum has found that the vitamines of milk are not manufactured by the cow, but are taken directly by the cow from her food.

"Since animals store but limited quantities of vitamines in their tissues, yet pass relatively large quantities into their milk, it is plain that the milch cow is much more economical and efficient as a producer of vitamines than is the beef steer fed for slaughter."

In other words, we obtain from milk, vegetables and whole grains substances not found in meat, white bread or refined cereals. How is the mother to obtain these substances from food

when they are not present in that food? How is the child to obtain from the mother substances which the mother does not obtain?

No wonder maternity, rebuking the outrages imposed upon it by the commercial food manufacturer, revolts against the disregard of nature's laws under which it is forced to suffer, and expresses its revolt in terms of misery where happiness and health should reign.

"So long," says Sherman, "as we thought of nutrition in terms of proteins, fats, carbohydrates and calories, naturally we were inclined to assume that a diet consisting largely of breadstuffs or other grain products could be balanced by the addition of meat. In fact," he continues, "it has long been more or less common to think of meat as the animal food par excellence, and milk has often been spoken of as a meat substitute, whereas it is vastly superior to meat as a source of supply of substances not found in meat at all.

"Meat, except in traces, not only does not contain the salts of iron, lime, potassium and magnesium as they are found in milk, but it does not contain the 'fat soluble A' found in cream, or the 'water soluble B' found in skim milk, for which reason it is in no manner suited to take the place of milk, green vegetables or whole grains in nutrition.

"The inadequate lime content of meat has long been known," Sherman asserts, "and the inefficiency of ordinary meats as sources of vitamines has been strikingly demonstrated by Osborn, Mendel, McCollum and Simmons.

"Hence," he concludes, "we can no longer think of milk and meat as interchangeable, or of meat as a full equivalent of milk in the diet."

We are beginning at this belated date to realise that food calcium is indeed one of the mysteries of life, and that without food calcium, which is but an organic form of lime, and its associate salts and solubles we condemn our little mothers and their babes to death.

§ 50—THE ADVERTISING AGENCY

Medical literature is now crammed with the truth concerning food calcium, which, until the publication of "Starving America" six years ago, was rarely referred to.

The plain people do not bother their heads about medical literature, hence they have not heeded the perils that calcium deficiency places in their path.

Milk is the heaviest calcium supply truck, next to whole grain breadstuffs, now carting lime in assimilable form into America's storehouses of health.

Next to milk and whole grains the green vegetables and edible leaves common to every American garden, are the great calcium providers.

These three forms of food not only yield lime in abundance, but they yield the now famous "fat soluble A," and the equally famous "water soluble B" in quantities sufficient to promote growth and to maintain health.

They also yield those complex compounds of phosphorus, potassium, iron, magnesium, sulphur, sodium, silicon and the other organic salts of the earth in happy abundance.

McCollum ranks the green vegetables and edible leaves like lettuce, spinach, chicory, parsley, cabbage, etc., very much richer in calcium and "fat soluble A" than cereals. Unfortunately by "cereals" he means the refined products obtained from milled grains which have lost not only their vitamines, but their salts as well.

If we foolishly refined our lettuce, parsley, chicory, cabbage, spinach and other greens and vegetables as we refine our wheat, corn and rice, they would also rank low in life-giving properties. Fortunately we cannot refine vegetables except by stupid methods of cookery, so we have few problems of refined vegetables on our hands.

These 1918 observations upon diet by some of our most eminent scientists are among the surprises unfolded every day.

Away back in 1910 the New York *Globe* through its columns

not only permitted me to make these same assertions, but went much farther in its characterisation of America's food follies, and for eight years continued them daily.

Nearly six years have passed since the publication of "Starving America," a book that inspired many commentators to say its author was riding a pet hobby to destruction, and yet to-day those same commentators are confirming by laboratory experiment the conclusions set forth in that book.

America no longer needs any further facts on the subject of nutrition. The archives of its laboratories are swollen with facts. What America needs now is the application of them and their recognition by commercial food factories and their advertising agencies.

I abandoned the field of food advertising six years ago for the reason that all of us were lying about food, not so much in malice as through a blind commercial enthusiasm that could not be justified and would not submit to disillusionment.

Advertising agencies then as now were spending millions of dollars through newspapers and magazines, in lithographs and street cars, instructing the people in truths not true. All of us, I am now speaking of the advertising men, were pushing into greater prominence the very foods that ordinary decency should have inspired us to condemn.

We were leading the people farther and farther afield. We were miseducating them, setting up false standards for them, shoving them ever farther away from the fundamentals of nutrition, surrounding them with artificial compounds from which all the life and vitality had been extracted.

We were debauching the American people but we were satisfying our employers, and making millions of profit for them out of their highly ornate labels, their decorated cans, cartons, packages, bags, boxes and glass jars, the contents of which outraged the laws of nutrition now recognised by science as absolute and inexorable.

When I broke away from the advertising camp as it was then organised, I was chairman of the Vigilance Committee of the New York Advertising Men's League, and chairman of the Vigilance Committee of the Associated Advertising Clubs of the World.

When I quit these organisations my friends, almost to a man, thought I had been obsessed and had lost my balance. I was the stray sheep of the fold, and because my journey was into barren lands that promised nothing, none followed me. I addressed conventions of advertising men in Boston, Baltimore and Rochester, and wrote articles on the subject for *Advertising and Selling, The Editor and Publisher* and *Printer's Ink,* but my efforts fell on deaf ears and advertising ethics did not change.

To-day the scientific laboratories of Europe and America are driving all advertising men into confession and the war has only served to emphasise the hopelessness of their position. The magnificent men who do so much to influence the thought and habits of their time are face to face with revolution.

What benefactors they would be if the vast sums of money now passing through their hands were spent in exploiting those foods which during three generations in America have been gradually abandoned!

What benefactors they would be to the whole world in the reconstruction period now dawning, if they turned away from manufacturers of foodless foods and devoted their superb talents to the development of foods that will sustain life, nourish prospective mothers, maintain the health of nursing mothers, develop normally the growing children of the nation, and feed the workers of the world in a manner that would insure for them the maximum of strength, life, health and happiness.

Behind all their errors lie the unnoticed and neglected mineral salts and vitamines against which the food manufacturers of America have made their most violent attacks, and out of the world's loss of which they have reaped their heaviest profits.

The war must bring to us a realisation of these truths, and all the reform that goes with them, otherwise the blood of our youth will have been shed in vain, and as far as preventable diseases are concerned the world will be little better off than it was before the Hun unleashed his hounds of hell upon civilisation.

If my work on the New York *Globe* during long years of struggle has established anything it has established the fact that in the recognition and application of the truths of nutrition,

purely commercial institutions can and do find a profitable business, which the advertising agent can develop if he will.

Of what use are the food scientists if our food manufacturers intend to ignore them?

Of what use are our scientific laboratories if the rich fruits of their labors are not to be utilised by the industries that feed our men, women and children?

If science is to be looked upon as merely ornamental, as are the fancy labels on so many of our food products, then let us do away with science, because as long as it stands before us unheeded it becomes but a mockery, reminding us in vain of the things that God Himself has prepared for our benefit.

With this digression, which I consider timely and important, we shall continue.

§ 51—COW FEED, HORSE FEED AND FOOD

In New York City, Armour & Co. discontinued the killing of dairy cows because of tremendous losses sustained through the excessive number of condemnations resulting from generalised tuberculosis. On the killing floor these cows could be milked, showing that they had been producing right up to the day of slaughter.

In one certified dairy herd in New York State 124 of 125 cows were found in a state of malnutrition clearly indicative of the unfitness of their food.

The daily dietary of these cows consisted of:

Ten pounds beet pulp (the exhausted residue of the beet sugar industry).

Ten pounds alfalfa (good food).

Two to ten pounds degerminated corn meal and brewer's grain (brewer's grain is the exhausted refuse resulting from the production of beer).

To this mixture was added from one-half to one pint oil meal or gluten feed. Oil meal is the residue of the process employed in the production of cotton seed oil. Gluten feed is the residue of the process employed in the production of glucose.

Many of these cattle foods are impoverished foods, yet they appear on the formula of the certified dairy by reason of the fact that they satisfy the modern dietitian's erroneous idea of a "balanced ration."

November 15th, 1912, all the cows in the herd were tuberculin tested. Two were found to react to the test and were withdrawn from the herd.

May 20, 1913, the herd, having been on the "scientific calorie diet" for nearly one year produced fifteen reactors. The condition was beginning to alarm the owners of the cows.

In the meantime the stable superintendent had placed his delivery horses on the impoverished cow food. He was anxious to make a record for himself and as the cow food was cheaper than the horse food, he made the change. Between the fifty-sixth and seventieth days the horses on the debased food began to show the same symptoms of acidosis, emaciation and anemia characteristic of the cows.

The horses were then put back on whole grains and grasses, whereupon they promptly recovered. The cows were continued on the same refined diet until a veterinarian, noting the experience of the stable superintendent with his horses, declared the condition of the cows, favourable to the rapid development of tuberculosis, was due to the character of the food consumed by them. He immediately ordered a change, notwithstanding the high calorie value and the scientific proportion of carbohydrates, proteins, and fats with which the certified milk producers were being nourished.

A contrast to this episode, concerning which more will be said later, regarding the disastrous results of the use of demineralised food on milk-producing cows and mothers, is to be found in the experience of David T. Arrell, Youngstown, Ohio, breeder of thoroughbred American trotting horses.

Arrell has bred, broke, trained, and developed prize-winners on four points—food, pasture, shade, and stable. He so keenly recognised the fact that the quality of his horses, their health, vitality, endurance, resistance to disease, and general physical perfection depended upon their food that he went so far as to provide No. 1 unbleached oats for which he paid, prior to the outbreak of the war, $1 a bushel, laid down in Youngstown.

As a practical horse-breeder he had noticed that his animals fed on unprocessed or non-by-product foods remained practically immune to all the equine diseases with which the average horse-breeder is plagued.

As against this observation concerning the vitality of the horse, properly fed, officials of the Bureau of Animal Industry estimate that from 35 to 50 per cent. of all the milk-producing herds in the United States are affected with tuberculosis. All of these herds are fed more or less on exhausted or refined foods.

These diseases of disturbed metabolism, not only with respect to cows and horses, but also with respect to the human being, are as prevalent as the deaths of 400,000 children under ten years of age in the United States every year might indicate.

Lovelace reports 936 cases of peripheral neuritis in a railroad hospital in North Brazil. More American refined food!

Heizer, Fraser, Aaron, Higet, and others, as we have seen, have demonstrated the insufficiency of demineralised foods of high calorie value in the Culion Leper Colony, the Straits Settlement, and Billibid Prison.

Caspari and Mosykowski report practical experiences in New Guinea and Berlin which caused them to conclude that human neuritis is a widespread disease of disturbed metabolism caused principally by refined carbohydrate foods, the high calorie value of which is not disputed. Human neuritis is but one of the many symptoms of acidosis, but one of the many food diseases.

FOUR: EIGHT POISON SQUADS THAT CRY FOR ACTION

FOUR: EIGHT POISON SQUADS THAT CRY FOR ACTION

§ 52—THE MADEIRA-MAMORE CASE

Let us see how the facts recorded through these pages are illuminated by certain human experiences of intense dramatic interest.

The Madeira-Mamore Railway Company in 1914 went into the hands of a receiver, after constructing a single track two hundred and thirty-two miles long connecting Bolivia with Brazil.

The first mile of this railway was laid just ten years ago, its object being to exploit the rubber industry of South America, not to advertise the dietetic virtues of ripe fruits, or fruit juices, or the deficiencies of American diet.

In the construction of its two hundred and thirty-two miles of track four thousand men were literally starved to death on a white bread diet. Those who escaped death owed their good fortune to the juice of fruits

Most of the victims of acidosis, or as they called the disease in the State of Matto-Grosso, "beri-beri," are buried in Candelaria Graveyard, three kilometres south of Porta-Velho, midway between that town and Santo Antonio—the district explored by Theodore Roosevelt.

When the appalling history of this poison squad holocaust was written by engineers connected with the enterprise all reference to the deaths by white bread starvation among the laborers, after a conference of the railroad officials, was deliberately blotted out. The officials thought the public might misinterpret the facts at the expense of the country through which the railroad had been projected, and it was decided as a good business policy that no mention should be made of the tragedy in the various articles written for electrical, engineering, and scientific publications.

When P. H. Ashmead, chief engineer of construction, himself a victim of white bread acidosis, reported on the number of deaths in camp, exception was taken to his figures and his list of four thousand victims was cut in two so that in the records of the tragedy only two thousand names appeared.

Ashmead, one of the best known consulting engineers of New York, on the day he discovered the first symptoms of his approaching breakdown, determined to take passage for England on the next vessel out. Terrified by what he saw going on about him he had good reason to fear that he, too, was entering the shadows of death.

The dietetic treatment he finally underwent and which saved him from interment in Candelaria Graveyard I shall describe.

H. F. Dose, one of the Madeira-Mamore engineers who devoted three years to the completion of the work started by P. H. Ashmead, fortunately made numerous observations and kept in close touch with the twenty physicians of the company. Three of these physicians, among whom was Dr. Lucian Smith, were stricken with the disease but escaped death.

All the facts of the expedition, interpreted under the light of the *Kronprinz Wilhelm* adventure, a poison squad classic that you will soon explore, confirm the instant need of reform.

The laborers, of whom there were originally six thousand, consisted of Russians, Greeks, Turks, Italians, Germans, English, Japs, Hindoos, French, Jamaicans, Barbadians and Brazilians. The officers, engineers and physicians were chiefly British and American.

The labourers received the equivalent of $2.40 a day in United States currency. They were charged by the Commissary Department an average of one dollar a day for their food. The cost of this food, its inadequacy considered, was so high that it included the lives of the men.

A half-pound tin of glucose jam was sold to them for one dollar. A No. 2 tin of canned sauerkraut sold for one dollar. A No. 1 tin of canned sausages sold for one dollar. The No. 1 tin contained thirteen ounces. The No. 2 tin contained twenty-seven ounces.

White bread constituted the chief foodstuff of the men. It was baked in the camp from patent flour imported from the

United States in thousand-barrel lots, and was furnished by wholesale grocers in New York City under the most highly advertised brands on the market.

In addition to the white bread (acid-forming) were enormous quantities of hard white crackers (acid-forming) and tapioca (acid-forming) made from the root of the native cassava plant. Like farina, cream of the wheat, corn flakes, toasties, pearled barley, degerminated corn meal and polished rice, tapioca is a refined, denatured, demineralised, high-caloried, acidifying food.

Supplementing these one-sided units of nutrition were large quantities of lard (acid-forming), coffee, sugar (acid-forming), macaroni (acid-forming), and xarque (acid-forming). A few bags of rice (acid-forming) were also included.

In the nature of luxuries, sold to the men at enormous prices, were such foods as canned pork and beans (well balanced as to acid-forming and base-forming substances), canned spinach (which the men refused to eat because they did not like its quality), canned wieners (acid-forming), canned jam (acid-forming), corn flakes (acid-forming), oatmeal and condensed milk (well balanced).

The oatmeal and condensed milk were confined to the officers' quarters.

For breakfast the labourers ate white crackers and white bread with plenty of black coffee, sweetened with sugar. As they had to pay for their own meals, and pay heavily for them, they economised as much as possible, believing as most others believe, that bread is the staff of life, and in itself sufficient to maintain strength, energy and health.

At noon they ate white bread, white crackers and xarque, with more coffee and sugar. Occasionally dried codfish, ham or bacon was substituted for the xarque. Xarque is dried beef, which looks like leather. It is packed in slabs or layers, weighing fifty pounds each. Each slab is several inches thick, and as dry and hard as wood. Before cooking, the xarque was soaked over night in water, and then boiled.

In the evening the men ate more white bread, crackers and xarque, and occasionally indulged themselves in a can of sauerkraut, a can of pork and beans, or a can of jam.

The French, Jamaicans and Barbadians grouped together, and

every day made what the others called "sinkers," a sort of heavy doughnut composed of white flour, sugar and water, fried in lard.

All of the foods in the labourers' camp, with the exception of the beans, which they ate sparingly on account of their high cost, were of the acid-forming type. The base-forming substances were not only deficient in quantity, they were not present at all.

Acidosis under such conditions was inevitable.

The officers, many of whom escaped serious forms of the disease, enjoyed a larger variety of foodstuffs from which to choose, including dried fruits (base-forming), nuts (base-forming), oatmeal (in itself almost a complete food), and potatoes (also base-forming).

Chief Engineer Ashmead, who ate largely of white bread, mashed potatoes and fresh meat, obtained by slaughtering in camp an occasional beef-steer imported on the hoof for that purpose, began to manifest the first symptoms of the disease almost as soon as the laborers themselves. The fresh meat, of which he partook abundantly, and which was reserved for the officers' use, did not act as a prophylaxis against the disease because fresh meat, or any other kind of meat, lacks the base-forming substances so indispensable to the integrity of the internal secretions.

The first symptoms observed among the laborers and officers affected were manifested in a tendency to stub their toes while walking along smooth roads. The foot would seem to drag. After that a slight swelling appeared in the ankles, which gradually extended upward to the knees with loss of sensation. When this swelling was at its height a dent in the flesh made by pressure of the finger would remain for a long time.

Shortness of breath and palpitation of the heart, with tremor of the nerves were the next symptoms, after which the men began to walk as though they were suffering from locomotor-ataxia, with the halting, hesitating, uncontrolled stride characteristic of that disease.

As the cases advanced the swelling subsided, and the leg gradually wasted away, until prior to death nothing remained apparently but the bone and skin.

Before death all the men were completely prostrated and helpless. None of the drugs with which the physicians were provided had any effect. Finally the doctors ordered "no more rice." They thought that rice was the bugaboo because they had been reading of the relationship between rice and "beri-beri." They did not know that rice had about as much to do with the fatal outbreak of the disease which they characterised as "beri-beri" as a baby carriage influences the eruption of the molars of its occupant.

As the poor devils gazed in the direction of Candelaria Graveyard where white flour was to disturb them no more, they might well have chanted, "Eventually! Why not now?"

§ 53—SPURNING MONKEY FOOD

Chief Engineer Ashmead noticed the development of the disease in his own case under circumstances that impressed all its details upon his mind. The camp had lost a man in the jungle, so dense that once a man got into it he lost all sense of location. When lost it was a serious problem to find the way back to camp. Ashmead participated in an extended search for the missing man, which failed. As night came on he gave orders to blow the camp whistle at short intervals until morning, that the sound might give the lost man some guide through the heavy brush.

In directing the search Ashmead had to climb a slight hill. When he reached the top he was "out of breath" to such a degree that he had to stop in his tracks. When he removed his leggings that night he thought he noticed for the first time that he was "taking on flesh." He certainly was growing "stouter." His ankles were "thicker."

He soon became sure of this, for in a few days he found it difficult to buckle the straps of his leggings. Then came the consciousness that he was losing his appetite for bread and meat. For the first time in his life he experienced a craving for orange juice. He had never been fond of oranges until that time.

On the fifth day following the first appearance of his ankle

symptoms he noticed when he pressed the flesh at the ankle his finger mark remained.

Laborers were dying around him everywhere. They had "beri-beri," the doctors all agreed. He examined their symptoms and discovered his were like theirs. "I've got it too!" he said, and the doctors ordered him away immediately.

He returned to England and on the ship fortunately found plenty of oranges. Throughout the entire journey he ate little else and after landing in England he continued to saturate himself with orange juice. Within sixty days his heart dilatation had disappeared and, except a depressing sense of lassitude for the following six months, he was apparently none the worse off for his experience.

Oranges are base-forming, as are the juices of all other fruits. The value of fruits consists in their alkaline mineral salts and feeble fruit acids.

Most fruits are rich in potassium and calcium salts, which are united with the tartaric, citric and malic acids that produce the agreeable flavours of the fruit. These feeble acids are quickly burned up or oxidised in the body into alkaline carbonates.

It has been demonstrated on hundreds of occasions that these fruit acids exercise a wonderfully benevolent action upon the blood and kidneys.

In such violent diseases as scurvy, beri-beri, anemia, neuritis, acidosis and other morbid conditions in which the tissues are bathed in acid secretions the alkaline minerals of fresh fruits prove invariably of great benefit.

The lemon, the orange and the grape are invaluable in such disorders.

The peculiarly pleasing fruity odour of ripe fruits is due to the presence of ethereal bodies which completely elude chemical investigation. Nobody knows just what they are. It is doubtful whether anybody ever will know.

Artificial fruit flavours, made in the laboratory from coal tar, ethers, esters and aldehydes, grossly resemble the odour and flavour of certain fresh fruits such as the peach, banana, pine-apple, strawberry, and apple. They not only have no nutritive value but in many instances are actually dangerous because they

are used to disguise otherwise inadequate foods to make them more pleasing to the palate.

Such foods never fool the stomach, yet where there is controversy between eminent scientists in the employ of commercial institutions, and apparent conflict between the methods adopted by the Almighty and the theories advocated by certain professors, the individual possessed of a little reverence for the things God has wrought and a little common sense with respect to his own body will decide against the professor in favour of God.

Ashmead, although he did not know it, was making use of the alkaline earthy salts of the orange to his own benefit.

There was no calcium in the Madeira-Mamore Railway poison squad diet.

One of the suppressed facts in connection with its mortality records was the scourge of tuberculosis that swept over the men who escaped "beri-beri."

Both Ashmead and Dose, from whom I have obtained in person the facts recorded here, informed me they lost as many men through tuberculosis as through the disease the doctors called "beri-beri." All other engineering enterprises, all other large contracting efforts, all other army or navy expeditions or exploring adventures in which, through accident or ignorance, the base-forming elements of food are not properly provided, meet with the same fate.

How can we forget that in a modified but none the less serious form our American school children, particularly the children of the poorer classes, are robbed of the elements of a base-forming diet?

In their limited selection of foods all the following refined, demineralised or acidosis-producing products are found: beef, pork, lamb, liver, ham, white bread, soda crackers, wafers, biscuits, doughnuts, buns, rolls, pie crust, lard, lard compound, cake, corn flakes, corn meal, farina, tapioca, polished rice, corn starch, sugar, glucose, syrups, cheap jams and jellies, penny candies, etc.

The chief base-forming foods are oranges, lemons and ripe fruits of all kinds, the outer grains, such as whole wheat, whole corn, natural brown rice, whole rye, greens of all kinds, lettuce, beet tops, celery, spinach, cabbage, onions, cauliflower, asparagus,

the roots of tubers, potatoes, carrots, parsnips, turnips, beets, beans, peas, lentils, nuts of every kind and unsulphured dried fruits, such as prunes, black raisins, currants, sun-dried apples, apricots and peaches.

Egg albumen or egg white, like meat, is acid-forming.

Egg yolks are base-forming.

Milk is physiologically balanced, as to base-forming and acid-forming substances.

In accordance with their custom or ability to obtain eggs, an abundance of milk, fruits and vegetables properly cooked, the children of the poor are saved from the extreme acidosis which kills quickly as it did along the Madeira-Mamore Railway.

So many thousands suffer from malnutrition without knowing it, from anemia, from impaired vitality, from lowered resistance to disease, from "laziness," and from other serious departures from normal physical stamina that end in misery, impaired efficiency and untimely death, that it is time indeed the public understood the relationship between base-forming and acid-forming foods.

The death of the four thousand railway laborers who built those two hundred and thirty-two miles of railway that run by the Candelaria Graveyard represent not only preventable loss of life, due to ignorance of the laws of nutrition, but they also represent tremendous financial losses sustained by the builders of the railway who, handicapped by sickness and inefficiency, poured more money into the construction of their project—a hundred-fold more—than would have been necessary had the diet of their men been properly safeguarded and less false economy invoked.

Men who are not fed properly cannot yield productive energies. Sick men or dead men cannot build or dig. Soldiers improperly fed cannot long endure under the terrific strain to which they are subjected.

It is a curious but tragic fact that thousands of healthy monkeys played around the Madeira-Mamore camp where human beings were dying by the score. The monkeys lived, enjoyed life and maintained their energy and activity on a diet of tropical fruits and nuts. Their presence in the vicinity of the sick laborers, who fell as fast as they might fall in battle, seemed

to be an effort of Mother Nature to speak to her unfortunate human children, suggesting a remedy for their misery.

The food of the monkeys was available. It was base-forming food, but the men, who, even as labourers, had conceived astonishing ideas of class distinction, had already dubbed it "monkey food." In their reluctance to subsist on "monkey food" they rejected what would have saved them, even as the sailors aboard the *Kronprinz Wilhelm* rejected and sank the whole wheat cargoes of two British merchantmen, notwithstanding their dire need of the thousands of pounds of bran and germ contained in those cargoes.

With respect to his food man has ever been a contradiction and a fool. The fixed laws which control the processes of nutrition are so simple, so obvious and so actually luminous that a child of twelve can grasp them.

Man alone is the only animal that ignores them. The Great White Plague and many of the other ills directly traceable to inadequate food, through the use of which the human body is deprived of the elements necessary to maintain its integrity, could be banished from the human race if the human race would only apply to its dietary the fixed laws which control the resistance of the sheep and horse to the same disease, and the disregard of which makes the hog and the cow a constant prey to it.

The reluctance of the Madeira-Mamore poison squad to eat "monkey food" and the ignorance of the crew of the *Kronprinz Wilhelm* in rejecting foods that would have saved them, have done more than merely breaking down the Brazilian railroad, more than merely compelling a German raider to make a dash for port with a crew of sick men.

They have brought home to America the importance and the significance of understanding its food supply, and of making a belated resistance to the inroads which commercialism, stupidity and false taste-standards are making upon them and their children.

§ 54—SHERMAN, FORBES, HART, MAXWELL, STEINITZ, ZADIK, LEIPZIGER, ROHMAN, GUMPERT, EHRSTROM, METTLER, SINCLAIR, VOIT

Does the Madeira-Mamore poison squad really bear any relationship to the average American food?

Henry C. Sherman, Columbia University, declares: "Possibly because the crudity of the views formerly held and still sometimes met (especially in fraudulent advertisements of proprietary foods) tended to bring the subject of nutrition into ridicule, the study of the phosphates and other phosphorus compounds in food and nutrition was very generally neglected. Recently, however, the significance of phosphorus in the growth, development and functions of the organism is at last being adequately recognised."

Phosphorus was only one of the twelve mineral elements removed from the foodstuffs of the Madeira-Mamore poison squad. The investigations of Forbes, at the Ohio Experiment Station, indicate that much of the malnutrition is not due to a low protein diet, but to a deficiency of phosphorus and calcium in the food supply.

Here are but two of the mineral elements specially studied in the diet of hogs, cows, and American homes. Let us look at them, unmindful of the other ten.

Phosphorus is found in the body as phosphorised proteins called nucleo-proteins existing in the cells and tissues. True phospho-proteins exist in casein (milk) and ovovitellin (egg yolk). In brain and nerve substances, and also to some extent in other tissues, the phosphorus appears as phosphorised fats called lecithins. Egg yolk is particularly rich in this form of phosphorus; so is the discarded germ of wheat, corn, rice, and barley.

Less highly organised forms of phosphorus are utilised by the body as phytin compounds or phytates. Wheat, corn, rice, barley, oats, and buckwheat, in their natural unrefined state, contain phosphorus in this form in abundant quantities.

Maxwell, in observing germinating seeds and developing chic

embryos, found that in the construction of the tissues of the growing vegetable or animal organism, the phosphorised fats played a most important part.

Steinitz, Zadik, and Leipziger discovered that these various phosphorus compounds could not be substituted one for the other. Simple proteins with inorganic phosphates do not make a substitute for phospho-proteins.

Rohman has shown that the phosphorised proteins furnish the material for tissue growth.

Gumpert and Erdstrom demonstrated that phosphorus equilibrium was maintained in experiments upon men when the phosphorus was consumed in the form of phospho-proteins, whereas when taken as dicalcium phosphate or as the potassium phosphate of meat the same quantity of phosphorus would not serve the needs of the body.

Hart, in feeding hogs in experiments conducted in the Wisconsin Experiment Station, found that 1.12 grams of phosphorus per day in its various compounds was just about sufficient for the hogs until they attained a weight of about eighty-five pounds, after which 1.12 grams became clearly insufficient for the needs of the animal.

Sherman, commenting upon this fact, states: "1.12 grams of phosphorus would hardly seem a desirable amount for a growing child of the same size, or for a fully grown man or woman."

It was said, as we have seen, that the Madeira-Mamore laborers died of "beri-beri," although the phosphorus had been removed from their food prior to their deaths.

Sherman, Mettler, and Sinclair, through the office of experiment stations, United States Department of Agriculture, reported a comparison of the amount of phosphorus contained in the food of typical American families. They did not go to the Madeira-Mamore poison squad for their facts. They went right into the homes of the people and showed that a freely chosen diet of our typical denatured food products does not furnish much more than 1.12 grams of phosphorus, estimated as 2.75 grams phosphorus pentoxide.

These investigations were carried out in a lawyer's family in Pittsburgh; a teacher's family in Indiana; a school superintendent's family in Chicago; a teacher's family in New York City;

a students' club in Tennessee; 115 women students in Ohio; a carpet dyer's family in New York; a sewing woman's family in New York; a house decorator's family in Pittsburgh; a glass blower's family in Pittsburgh; two mill workers' families in Pittsburgh; a mechanic's family in Knoxville, Tenn.; thirty lumber men in Maine; a farmer's family in Connecticut; a farmer's and mechanic's family in Tennessee; thirteen men students, five women students and one child in Knoxville, Tenn.; two Negro farmers' families in Alabama.

The study continued fifty-eight days and took the average from 12,238 meals consumed by men and 798 meals consumed by women.

Speaking of these analyses Sherman declares: "The results indicate that present food habits lead to a deficiency of phosphorus compounds and it is not improbable that many cases of malnutrition are really due to an inadequate supply of phosphorus compounds." He was cautious in his conclusions, but explicit. He did not comment on the fact that in removing the phosphorus from natural food all the other mineral salts, colloids, and vitamines with which phosphorus is associated are also automatically removed in the process, because one cannot be removed without carrying the others with it.

His experiments have proved, notwithstanding that in the American home many offsetting foods are consumed which were not available in the Madeira-Mamore poison squad, the mineral elements necessary to normal metabolism are nevertheless deficient in the typical American meal.

§ 55—ELIZABETH COUNTY JAIL

Next to tuberculosis the most commonly talked of infirmity of human flesh is the disorder popularly described as "heart disease."

Heart disease, as we know from the insurance companies, is constantly increasing in the United States. In all cases of mineral starvation brought about by a prolonged diet of refined food, examination of the heart shows dilatation. The heart is always

enlarged following a diet of the kind so few of us have fed to chickens.

Malnutrition and "enlargement of the heart" can almost be said to be synonymous.

In the food deficiency disease described as "beri-beri" the heart is always involved, just as it was involved aboard the *Kronprinz Wilhelm* and in the Madeira-Mamore Poison Squad.

In the disease which confused commentators sometimes call "acidosis," sometimes "pellagra," sometimes "edema," sometimes "neuritis," sometimes "general breakdown," the heart is always involved.

It is peculiarly noteworthy that the recorded increase in "heart disease" runs parallel with the symptom of milling introduced in the United States about 1879. Remember the heart of the dead frog. You will hear of it again.

Numerous instances are on record indicating that a deficiency of iron, phosphorus, potassium, calcium and the other mineral salts, colloids and vitamines always found with these salts in unmanipulated milk, butter fat, whole cereals, fresh vegetables, greens, and fruits leads to numerous forms of physical disorder in which "heart trouble" is one of the constant factors.

Many cases are on record proving that where offsetting foods are entirely missing from a refined food diet, the heart becomes involved in from forty to sixty days.

Many other instances are on record showing that where "offsetting" foods are consumed to an extent sufficient to retard the progress of mineral starvation, the development of the disease is delayed accordingly.

It is now known that where refined or demineralised foods make up a considerable portion of the diet the disease may be postponed for years, and then may be described as merely a mild or unrecognisable disorder, accompanied by a few not necessarily alarming but nevertheless unpleasant symptoms which do not, as a rule, cause their victim to become unduly anxious about his health.

Where the diet is abundant and includes a wide variety of foods, as in the case of the average business man who partakes of a more or less pretentious noon-day meal, while his growing family is lunching on left-overs at home, the body seems capable

of adjusting itself to a considerable abuse of acid-forming foods over a long period. The chapters on fatigue poisons will throw, in their proper place, a bright light on this dark subject.

It is now well established, however, that after the fortieth year the effects of mineral deficiencies begin to manifest themselves in "heart disease," the great fatigue accountant.

Until 1913 the medical profession in which the "show me" philosophy persists as nowhere else, was generally of the opinion that the disease called "beri-beri" was confined to the tropics.

For this reason it was never suspected that the "heart disease" of the United States and the "beri-beri" of the Orient might in some manner be related to each other, or at least due to causes which, while dissimilar in intensity, were nevertheless the same in character.

November 6, 1913, Dr. Herman D. Parker, of the United States Public Health Service, was detailed by his superiors to Elizabeth, N. J., to investigate an epidemic described as "jail edema," which had broken out in the county jail.

In this jail, as in many others, the food served its inmates was of the typical refined type, consisting chiefly of white breadstuffs, polished rice, boiled potatoes, oleomargarine, beef clods and coffee.

Its prisoners were confined only while awaiting trial under indictment, or serving a sentence of less than one year.

For fifteen years prior to the investigation of Dr. Parker, the Elizabeth County Jail, like most other jails, had developed a history of periodical epidemics of "jail edema."

Dr. Livingood, the jail physician, had made a record for three years of the mysterious disorder which had plagued his prisoners, noting that eighty per cent. of all the prisoners serving more than ninety days fell victims to the disease, which the United States Government officials finally diagnosed as "beri-beri," but which, as we shall see later on, has been described by other groups of Government officials as "pellagra."

In Dr. Parker's Public Health report of the Elizabeth Jail investigation he stated: "The fact that the disease existed so long without recognition in one locality leads to the supposition that it probably exists under similar circumstances in other localities."

"Dilated heart," "heart dilatation," "heart enlarged," are some of the official phrases used in describing the physical condition of the heart, in all the Elizabeth County Jail cases examined.

The fact, not the theory, that in every one of these Elizabeth County Jail cases involvement of the heart was noted as one of the chief symptoms, and the further fact that a demineralised diet of refined foods of the same kind consumed in such large measure by our growing children, most of whom are never destined to break into jail, was finally fixed as the cause of the disease, are singular indeed when it is considered that in "pellagra" and "beri-beri" and "jail edema" and "war nephritis" the heart is always involved in the same way.

The significance of this fact is still further emphasised when it is considered that the same character of "heart disease" is on the constant increase in the United States.

§ 56—THE BRITISH STEAMER "DEWA"

May 26, 1915, the British Steamer *Dewa* arrived at Quarantine in New York from Cienfuegos. It had been reported by wireless that on the vessel's trip from Rangoon to Natal, Brazil, eight of the crew had died of "beri-beri" and twenty-five more cases were on board.

Health Officer O'Connell boarded the boat when she arrived at midnight, and found a condition which caused something of a hubbub, although the same condition in more or less modified form is found all over the City of New York and no hubbub follows.

With Health Department Inspectors Kearney and Fallon, under the authorisation of Commissioner S. S. Goldwater, I made an investigation of the food of the crew, from which twenty-five cases of "beri-beri" were taken to the hospital at Swinburne Island.

Just six weeks before, the sailors had commenced to feel the effects of their diet, in substance almost identical with the diet of the Elizabeth County Jail.

The *Dewa* was putting on a cargo of sugar at the Keys in

Cienfuegos, Cuba, when one of the sick men died. Two others followed in quick succession.

The health officer of Cienfuegos, yellow inside, although not yellow outside, ordered the *Dewa* to sea at once. The English officers aboard were astounded. They protested.

First Officer A. Chambers and Steward A. Batterman declared they had never witnessed such an inhuman act.

"What shall we do? Our men need hospital treatment," was their appeal to the health officer.

"Go," was the answer.

And so, ordered from the dock, they put to sea with their cargo of sugar and sick men.

The health officer did not want to know the nature of the disease. He did not want his professional training to fructify on the spot. He cared nothing for diagnosis, prognosis, or therapeutics; all he demanded was that the crew of sick men should go out to sea and die.

It was nothing to him where they went, provided only they left Cienfuegos.

It did not concern him what kind of disease the *Dewa* might carry to some other port.

He didn't know that he had the remedy for the disease at hand, and could have saved all its victims.

He wanted to wash his hands of the whole affair, and he washed them, to his ignominy and disgrace, henceforth forever.

We shall let him pass.

Unable to obtain proper food or medicine, the *Dewa* sailed for New York. Five more of her men died at sea.

At the time of her arrival off New York nearly half her crew had succumbed. None of the officers was stricken. The firemen and deck crew were the chief victims.

According to the ship's manual, prepared by a British surgeon, the treatment for "beri-beri" is arsenic, strychnia and salt, followed by a diet of white bread and tea.

The steward was sure the *Dewa's* crew was suffering from "beri-beri" so, although he had no strychnia or arsenic aboard, he prescribed plenty of white bread and tea.

Upon their arrival they were taken to the hospital for more white bread and tea.

The daily food of the crew prescribed by the Government of India was as follows:

Natural brown rice ("ballam"), one pound, six ounces.
Wheat flour ("morda"), unbolted, ten ounces.
Dried peas ("dal"), six ounces.
Buffalo grease ("ghee"), two ounces.
Salt, one-half ounce.
Curry stuffs, one ounce.
Dried fish ("bhetki"), four ounces.
Potatoes and onions, six ounces.
Tamarinds, one ounce.
Tea, one-fourth ounce.
Sugar, one and one-half ounce.
Lime juice, one ounce.

The fish aboard was called "bhetki."

The "morda" was baked into cakes ("chupattee") with water and "ghee."

This diet would have prevented neuritis, pellagra, scurvy, edema, beri-beri or acidosis, but the supply of natural brown rice ran low. The peas were exhausted, and in their place the steward bought a quantity of white American flour and white American polished rice.

The crew divided themselves into two groups. One group would not eat the polished rice nor the white flour. The other group would not eat the natural brown rice.

None of the sailors who lived on the natural brown rice contracted the disease, in spite of the fact that the rice was musty.

I was face to face with the fact, not the theory, that whole unpolished rice, even when musty, will support life for sixty days, but on a diet of white flour for the same time, Man, regardless of his colour, will collapse.

I asked the steward what had become of the tamarinds.

"We did not stow enough of them," he replied. "Oh, if we only could have had some dates or other fruit."

He knew nothing of the base-forming quality of fruit, but he craved tamarinds and dates. Dates would have prevented the "beri-beri."

As a rule, even before the war, when dates were plentiful

the people looked upon them as luxuries, not as a medicinal food.

If the people of the world knew the value of the date, raisin, or of any other fruit, they would not only marvel over it as Moses did, but they would have it in their homes all the time.

The steward of the *Dewa* yearned for dates, but he could not get them on the open sea.

The American people, able at all times to put their hands on large quantities of fruit, eat sparingly of it—alas! too sparingly.

Looking at the date, as a mere fact, we find so many wonders that our American indifference toward it cannot be explained.

The date, like all other fruit, has saved lives wherever men have existed.

The instincts of the *Dewa's* steward ran true. It did not occur to him that the date will grow where nothing else will grow. All that he knew was that it did not grow at sea, and that he could not get it there.

The date palm in the hot deserts actually converts the dead sands that doze in the sweltering sun into a food, the flavour of which is not rivalled in the food world, and the value of which is the astonishment of the chemical laboratory.

Moses knew what he was about when he gave especial care to fruit trees. He forbade the Jews to cut fruit trees down even on their enemies' land. In this respect also he was unlike the Kaiser.

The *Dewa's* steward, when I told him of Moses's attitude toward fruit, and explained to him what fruit would have done for his sick crew, leaned dejectedly against the rail of the ship and said: "Moses was a wise man."

Even the heathens knew the value of fruits, inventing special gods to protect them, such as Pomona, Vertumnus, Minerva.

The palm tree on which the date grows was common among the Hebrews. They extracted honey from its fruit. They made bread and cakes from it.

Dried and reduced to flour, caravans in the desert lived on it, but they did not sift it through gritz gauze or bolt it through silk cloth to take the life out of it for refinement's sake.

The Romans cherished it as the most aristocratic ingredient in many of their most famous dishes.

Our modern victims of folly are not blessed with any such enthusiasm. They are simply "modern."

§ 57—THE MISSISSIPPI PENITENTIARY POISON SQUAD

About the time the symptoms of mineral starvation were manifesting themselves aboard the converted German cruiser *Kronprinz Wilhelm* on the high seas, physicians and surgeons connected with the federal public health service were undertaking a series of tests to demonstrate that pellagra was caused by improper food, and that the elimination of the cause would cure the disease.

An exhaustive review of facts relating to the diet of workingmen's families, particularly among the poorer classes, resulted in the disclosure that pellagra always followed a diet rich in carbohydrates (refined sugars and starches) and that it had a tendency to show itself wherever there was a rise in the cost of food, thus making it harder for the poorer families to obtain a nourishing diet.

In the facts compiled, not one reference was made to the necessity of substituting whole corn meal undegerminated, either white or yellow.

No reference was made to the fact that whole wheat meal converted into bread and breadstuffs, instead of the white bread and biscuits of the south, would prevent pellagra.

No reference was made to the fact that natural brown rice, freshly milled, so easily obtainable in the south, should be substituted for the polished and demineralised product extensively consumed among the poor.

No reference was made to the fact that all these foods could be obtained at a price even cheaper than their refined, demineralised, and inadequate commercial substitutes, consumed in such enormous quantities throughout the United States.

Dr. Joseph Goldberger, who was among those to visit the stricken crew of the *Kronprinz Wilhelm*, April, 1915, had been seriously concerned with the obvious inadequacy of the diet of the thousands of victims of pellagra every year in the south.

Accordingly, three experiment stations were established, two at Jackson, Miss., and the third at the Georgia State Sanatorium.

In his preliminary study of 200 cases during the spring and summer of 1914, Goldberger had come to the conclusion that "carbohydrate foods" are responsible for pellagra, and, accordingly, he urged a reduction in the diet of starchy foods in the treatment of the disease.

Then came the sensational poison squad experience in which twelve convicts, six of whom were murderers, risked their lives in the interests of medical science in order to enable Goldberger to prove his theory that pellagra is directly due to the consumption of inadequate food.

These victims in the Mississippi penitentiary were fed exclusively on degerminated and demineralised corn products.

November 2, 1915, after six of the men had developed pellagra in a pronounced form, and two others had shown definite symptoms of the disease, Governor Brewer pardoned them all.

The authorities had kept the test as secret as possible. They feared that relatives of the prisoners who submitted to the ordeal, might invoke the habeas corpus or resort to some other legal device to rescue the victims of the experiment.

Several of the convicts attempted suicide during the test. Two of them, Guy R. James and D. W. Pitts, made formal application to the penitentiary board to be sent back to their cells in order that they might serve their life terms in preference to continuing further the sufferings they underwent.

One of the pardoned convicts, W. H. English, describing his experience on the day following his pardon, stated:

"For the first few months I felt only lazy and stupid. Along about July 1 I began to lose weight. At that time I tipped the scales at 167 pounds. Now I weigh 118 pounds. When Governor Brewer pardoned us yesterday he told us we could remain in the penitentiary and be cured by a 'balanced diet' treatment. One might think this invitation would have been accepted by some, but not even one of the eleven accepted it. The twelfth had broken down two months before and was sent home." It was reported that he had committed suicide.

As a result of the pellagra poison squad experience the follow-

ing remedy, which in no manner refers to whole grains or unrefined cereals or adequate breadstuffs, was set forth:

"An increase in the diet of fresh animal and leguminous foods."

"Ownership of milk cow and increased milk production for home consumption."

"Poultry and egg raising for home consumption."

"Stock raising."

"Reduction in the diet of the carbohydrate or starchy foods."

"Diversification and the cultivation of food crops, including an adequate pea patch, in order to minimise the disastrous effects of a crop failure and to make food cheaper and more readily available."

"Make the other class of foods cheap and readily accessible."

"Improve economic conditions, increase wages and reduce unemployment."

To these recommendations with which it will be difficult if not impossible to conform, the following may some day be added:

Eat the foods already at hand, but eat them in their natural, unrefined state. (Not difficult.)

Grind the whole corn and consume it in the form of corn bread, corn pone, corn cake, corn porridge, containing all of the corn. (Not difficult.)

Adopt the same principle with regard to wheat, barley and rice. (Not difficult.)

Eat something green every day and make sauces or soups of the waters in which vegetables are boiled, instead of throwing them down the waste pipe or into the sink. (Not difficult.)

Forget the fresh meat if you can't get it and use milk and eggs, beans, peas and lentils instead. (At least not as difficult as getting and keeping a cow.) Economical and sensible.

But a mere fragment of the real value of the pellagra poison squad has been given to the world. Through faulty interpretation the sufferings of men, so severe that their very violence caused some of them to attempt suicide, have been in this experiment almost lost to their fellows, even as the *Kronprinz Wilhelm* experience was lost to humanity.

According to the reports given out the men were fed collards, hominy, corn bread, corn grits, fried mush, biscuits, brown gravy,

rice, coffee, and sugar. Nothing was said of the fact that hominy is a demineralised, degerminated, refined corn product; that corn bread is the same kind of a demineralised corn product; that fried mush, made from degerminated corn meal or grits is the same kind of a refined corn product, and that it was not because they were corn, but because they were bolted corn, only part of the corn, that a diet of such foods resulted in disastrous consequences, which consequences, in this case, were aptly named "pellagra," just as they would have been named something else had they been named by another set of scientists.

§ 58—WATERY TISSUES OF THE HOG, PASTY COMPLEXION OF THE HUMAN

Before reviewing the most startling poison squad experiment of all time it will be well to emphasise the significance of the Madeira-Mamore tragedy and the Elizabeth County Jail episode by checking up on the feeding of sheep and hogs.

Figures provided by the United States Bureau of Animal Industry show that less than three one-hundredths of 1 per cent. of all the sheep killed in one federal inspected slaughterhouse during a period of twelve months ended November 1, 1913, had to be condemned on account of disease; whereas in another establishment of the same kind one-sixth of all the hogs slaughtered during the same twelve months had to be condemned.

This means that for every one sheep found to be diseased 528 hogs were found to be similarly affected. This vast difference, startling in its suggestiveness, between the sheep and the hog, in regard to their respective resistance to disease, draws attention to the difference between the methods whereby they are fed.

There are hundreds of examples of the manner in which the condition of an animal's tissue tone and general health are affected by its food.

The bureau of Animal Industry, Bulletin 25, issued December 16, 1913, reports on the fact that cattle fattened on an artificial diet of cottonseed cake and beet pulp, notwithstanding the pres-

ence of silage in their food, lost by shrinkage while still alive more than twice as much weight as cattle fed on the natural diet of grasses and the seeds of grasses, during transit from point of origin to destination.

September, 1900, Dr. Oscar Liebreich of the Imperial Board of Health, Berlin (Geheimer Medicinalrath, Ordenlicher Professor der Heilmittellehre und Direktor des Pharmakologischen Instituts des Königischen Universität, Berlin), made the following report on the use of coloring matter by sausage makers:

"It is now close upon half a century since the coloring of pale-colored sausages was introduced. Many farmers and cattle breeders have now adopted the method which enables them to enhance the weight of their cattle and hogs. Instead of feeding, as used to be done, with leguminous substances with bran, potatoes, skim milk, etc., the animals now get all sorts of so-called strengthening feeds: Farmhouse refuse (tankage, garbage, by-products of breweries, cottonseed meal, exhausted pulp) and the like.

"This method of fattening produces a considerable modification in the composition of the flesh. While under the old system of feeding, animals with solid, substantial, muscular flesh, rich in colouring substance, were produced, the flesh formed by present artificial feeds is very fat, contains a great deal of water, and is very poor in colouring substance.

"The old system of feeding produced the fleshy pork; the new system produces fat pork.

"While formerly sausages were of a good red colour, they are now always pale. Hence the dye must be employed where people want the true character of modern pork to be disguised to resemble what it should be."

Here we have the rapid shrinking of the water-logged tissues of the artificially fed cattle and the anemic flesh of artificially fed hogs to teach us the dangers of refined food in the production of enfeebled vitality and disease.

The sheep still feeds itself as it has fed for thousands of years. It follows nature's instinct. It knows nothing of the artificial by-products upon which dairy cows and hogs are crammed. In consequence it resists nearly all diseases and maintains a state of normal health.

In 1913 M. B. Ravenel, professor of bacteriology of the University of Wisconsin, made an examination of conditions in the slaughter houses of Wisconsin and other states. In addition to the many other diseases with which he found the hog to be cursed, he declared in his report:

"Twenty per cent. of the average lot of hogs brought to slaughter are tuberculous. These hogs do not develop the disease within themselves, but contract it by feeding on by-products of creameries and following tuberculous cows engaged in the production of milk."

Here we have a startling similarity between the pale, watery tissues of the hog, including the diseases to which such devitalised tissues offer little or no resistance, and the pale complexion, anemia or hemoglobin deficiency of the human being.

Dr. Rolf Wilson is responsible for the following statement, published in the *Medical Times,* January, 1914: "R. L. Babcock, Chicago, rarely finds in city dwellers the hemoglobin above 90. I believe the prime reason for this," he says, "is the demineralisation of the food now put upon the market."

In the deficiency of certain food minerals in the diet of the hog the same results are noticed as those observed in the human animal under similar conditions of mineral deficiency. We shall now see how this similarity has asserted itself in the most extraordinary poison squad experiment of history.

§ 59—THE "KRONPRINZ WILHELM" POISON SQUAD

On April 11th, 1915, the Germans brought to the shores of America a poison squad, the first real poison squad of history. There never was a poison squad like it. There probably will never be another. All the so-called scientific short-time feeding experiments, and all their misleading results were put to shame by the experience of the Kaiser's sailors.

Yet, to this day, the governments of the United States, Great Britain and France have persistently ignored the lesson unwit-

tingly taught by the Germans. It is doubtful if the Germans themselves have profited by that lesson.

April 11th, 1915, the converted cruiser *Kronprinz Wilhelm* was discovered lying at anchor in the James River, off Newport News, to which port she had followed her raiding predecessor the *Prinz Eitel* (Attila) *Friedrich.*

After sinking fourteen French and British merchantmen, she had successfully run the gauntlet that brought her to her safe retreat in American waters. No one in the world dreamed that Sunday morning that the *Kronprinz Wilhelm* would some day carry American troops to France.

We are not concerned with the raider's exploits before she flew the Stars and Stripes, but with the consequences of her marvellous experience under the German flag.

When she put into Newport News she was stricken with a disease the doctors called "beri-beri."

One hundred and ten of her crew of five hundred were prostrated. The others were on the verge. Throughout the newspapers of the United States was spread the report that the sailors were the victims of eating polished rice.

Government experts, state experts, specialists in private practice, and great numbers of eminent health officers and physicians, hastened to the ship to hold consultations over the curious disease. They all pronounced it beri-beri and they all insisted it was caused by eating polished rice.

The medical magazines had been filled with discussions of beri-beri, always associating the disease with a diet of polished rice. Beri-beri and polished rice had become "scientific" twins. It was orthodox to think of them together, hence the opinion of the experts was sound enough to satisfy the world.

When, April 16th, 1915, I climbed up the side of the vessel (I will tell you how I got there later), I was admitted to the consultation of twelve doctors and officers who were discussing the queer malady, its cause and its possible remedy. "Surely it is beri-beri," they were saying, "but how does beri-beri differ from pellagra, and how does pellagra differ from scurvy, and how does scurvy differ from neuritis, and how does neuritis differ from pernicious anemia, and why is the disease not scurvy instead

of beri-beri, and why is it not pellagra instead of either?" and so on and so on.

There they sat, this group of mystified scientists, in the dining-room over the grand salon of the once famous North German Lloyd Transatlantic liner. The luxurious salon itself had been filled with coal. The ship's sumptuous cabins de luxe had been filled with coal.

Mystery, tragedy, contradiction and disease brooded in the heart of that once palatial ship.

The bewilderment of the doctors was not wonderful, for the *Kronprinz Wilhelm* herself was but a symbol of the bewilderment of the whole world.

I had no business on that ship. I had been ordered to keep off. I had exhausted every conceivable device and pulled every wire of influence. I had appealed to Washington in vain. I tried to act as a messenger for a ship chandler.

I had tried all the prominent physicians of Newport News, the Collector of Customs, the politicians. Everywhere I received the same answer. Journalists were barred from that ship by an edict that recognised no exception. The order of von Bernstorff was sweeping and from it there was no appeal.

In despair I stood afar off and watched the sombre grey hulk with her four grey smokestacks and her four grey guns. There, locked up in her sullen heart, was a great truth of unrecognised significance which America must soon learn or for her continued ignorance of which pay a dismal price.

I was barred from that truth. I was not permitted to pass it along. I was not a member of the inner circle of established reputations. Scientific bigotry and narrow ethics were keeping me out. I had no right to be interested in science yet I had given more study to the causes of malnutrition and had addressed more physicians on that one subject than perhaps any other man in America.

Why not outwit the pretence and the superiority and get aboard in the guise of some eminent person? Truth belongs to all. There is no monopoly of it. In its presence the strategies of war dwarf in dignity to the vanishing point. Strategy was the last resort.

It worked. Through its operation I found the truth and in pos-

session of it am able to contradict the scientific opinions that then swept across the country and that still continue to pose as truth. Polished rice had no more to do with the disease then ravaging the crew of the *Kronprinz Wilhelm* than horseshoes have to do with thunderbolts.

In addition to finding the truth I found myself in an embarrassing, a trying, a thrilling predicament. I had engaged the best launch available and in dignity was taken alongside the cruiser, where I presented the card of a celebrated New York physician to the officer who asked me what I wanted. I requested him politely to deliver "my card" to the ship's surgeon.

In five minutes I was summoned aboard and ushered through long shady passages covered with German inscriptions and photographs of the Emperor into the consultation room.

Twelve men, seated around a great table, arose to greet the "eminent physician." The ship's surgeon, Dr. E. Perrenon, and her officers, saluted me in semi-military fashion. Then the dignity of my entrance was exploded as if by a bomb.

A prominent health officer, one of the group of consulting scientists, recognised me. "Why," he exclaimed in a loud voice, "here is McCann of the New York *Globe*." It seemed that I had never heard such a loud voice in all the world. It sounded like a volley from the cruiser's four-inch guns.

Turning to the ship's officers, he continued, his voice seemingly louder than before, "Mr. McCann is a representative of a New York newspaper." Every word was separate and distinct. The entire sentence was full of barbed-wire and bayonets. Turning to me before any of the others could speak, he finished his assault by saying: "Where did you get the card you sent in? What is its meaning?"

Everybody bristled. An impostor had been discovered aboard the ship of science. Perhaps his mission was hostile. At any rate he was a newspaper man and newspaper men were anathema. The men remained standing, awaiting an explanation. I gave it to them. Some of them may be thinking of it yet.

It was no time for soft speeches. It was no time for ignorance in high places. It was no time for shrinking courtesy. The scientific gentlemen heard what was said and for the benefit of

the learned and superior persons who talk glibly of beri-beri and polished rice, it is all set down here.

I had no apology for my words and no time to waste. If there was beri-beri on that ship there were thousands of cases of the same disease in every State in the Union, and there was no earthly reason why a group of scientists should suddenly become hysterical over a condition on a German cruiser while lying at their own feet at home there were hundreds of such conditions which the scientists ignored.

No man interrupted me. I was as much shocked at their silence as they were at my impertinence, so I kept on and reminded them of many of the neglected truths of the diseases of dietetic origin.

Finally the ship's surgeon abandoned his seat at the table and advanced toward me. He extended his hand. He smiled. From that moment I knew we were friends. "I will hear all you have to say after the others have departed," he said.

When the others had boarded a launch and were taken ashore, he retired with me to his headquarters, and after an hour's conversation sent for the ship's cook. The three of us had it out together.

The polished rice explanation was the first lie to vanish. Polished rice was not responsible for the pathetic condition of the crew, for the reason that polished rice never appeared oftener than once in twenty-one meals.

But what did the men eat? The answer to that question is one of the most important issues now confronting America, Great Britain and France.

§ 60—TWO HUNDRED AND FIFTY-FIVE DAYS!

After leaving Hoboken, August 3rd, 1914, the German cruiser roamed the seas for two hundred and fifty-five days, subsisting on supplies taken from French and British merchantmen before she bombed them. During this period of two hundred and fifty-five days she touched at no port, depending entirely for coal and

provisions on her raiding ability and her speed in escaping French and British warships.

The cruiser's troubles began September 4th, 1914, when she sank the British steamer *Indian Prince,* bound from Bahia to New York, after seizing all her coal, meat, white flour, oleomargarine, canned vegetables, coffee and soda crackers. Her own supply of fresh meat was nearly exhausted when the *Indian Prince* crawled into view. The white flour was looked upon as manna from heaven. A month passed.

October 7th, 1917, the British refrigerator steamer *La Correntina,* bound from Argentina to London with 5,600,000 pounds of fresh beef, was sighted. The Germans ran her down and took from her enough fresh meat to supply her needs for several years. She crammed her own spacious refrigerators with hind quarters and ribs. She corned 150,000 pounds of rounds in addition to her supply of the chilled and frozen quarters.

She stowed enough meat to give each member of her crew as much as three pounds a day for an entire year. She also seized all the *La Correntina's* butter, white flour, tea, biscuits, sweet crackers, potatoes, canned vegetables, and her meagre supply of fresh vegetables before blowing her up. Six weeks passed.

November 21st, 1914, she captured the French bark *Anne De Bretagne* on her way from Fredrickstad to Sydney. This boat, before she was blown up, surrendered all her coal, white flour, butter, potatoes, canned vegetables, champagne and dried peas. The rest of her provisions went to the bottom.

The Germans had all the meat and bread and oleomargarine they could eat. With their twenty-six knots an hour they knew they could continue to scour the seas until the end of the war, sinking vessel after vessel, and obtaining coal and provisions as long as they kept their health.

Fresh meat, bread, and oleo and boiled potatoes are generally assumed to be life-sustaining foods. The Germans unwittingly had commenced to explode that theory.

December 4th, 1914, after she had been out four months, she sank the British steamer *Bellevue,* bound from Liverpool to South America. From this ship she secured four thousand tons of coal and an immense shipment of sweet biscuit with all the white flour, butter and canned vegetables the Englishman carried.

The subtle, slow-moving influence of their refined and demineralised diet had not yet broken the sturdy Germans. They had no suspicion that the fruits of their raids were actually eating into their lives.

On the afternoon of the same day she sank the French steamer *Mont Agel,* bound from Marseilles to South America. Before blowing her up she confiscated all her butter, white flour and potatoes. Each raid, while supplying tons of food, was intensifying the chronic acidosis that was finally destined to overcome her crew and compel her to make her last dash through darkness with all lights out and a full head of steam, into a neutral port. She would be out there yet sinking the Allies' ships if it were not for her typical American meals, plenty of fresh meat, mashed potatoes, canned vegetables, white bread, butter, sweet cakes and coffee.

Christmas of 1914 passed quietly, and three days later, December 28th, she sank the British steamer *Hemisphere,* bound from Hull to Rosario, obtaining five thousand tons of coal with a great quantity of white flour, butter, sweet cakes, potatoes and canned vegetables.

January 19th, 1915, she sank the British steamer *Porato,* bound from Liverpool to South America, after absorbing her coal, white flour, sugar, canned vegetables, oleo and a great quantity of Huntley & Palmer's sweet biscuits. So many of these biscuits were seized that tin boxes of them were given away as tips to the boys who ran out to her in small boats on the James River with messages, papers, etc.

I watched the boys take away their prize boxes of Huntley & Palmer's biscuits and after I had learned the truth I wondered whether the people would really never hear about it through the magazines and ladies' journals and other organs of uplift that carry the costly advertising of so many foodless foods.

January 14th, 1915, she sank the British refrigerator steamer *Highland Brae,* running between the slaughterhouses of Argentina and the meat markets of London. The temptation to seize more fresh meat was not resisted and in addition she took enough shoes to supply a small city. She also took all the oleo, white flour, potatoes and canned vegetables which the *Highland Brae* had aboard.

Scarcely had the bomb exploded which caused the British steamer to gurgle to the bottom when the British schooner *Wilfred M.*, from St. Johns to Bahia, came peeping over the horizon. In half an hour the Germans overhauled her and took possession of her cargo of salt fish, potatoes, white flour and butter.

The pallor of her crew and the dilation of the pupils of their eyes and marked shortness of breath here and there were observed by the ship's surgeon but were not considered significant and the men went on devouring their typical American meals, so highly rated by the advertising geniuses of the refined food industry.

February 5th, 1915, she sank the Norwegian bark *Samentha,* from Linton to Falmouth, loaded with a cargo of wheat—whole wheat. The germ and bran of that wheat would have been worth more to the rapidly succumbing Germans than its weight in gold and precious stones, but the Germans did not know they were sick. They did not know how badly they needed that whole wheat with its alkaline calcium and potassium salts.

They did not know that within a few weeks a hundred of them would pass just one inch beyond the limit of toleration and then fall without warning, paralysed, to the deck. In consequence of their faith in fresh meat, white flour, oleo, boiled potatoes and coffee, those thousands of bushels of whole wheat with their priceless salts were sent to the bottom. Not a bushel was transferred to the German ship.

February 23rd, 1915, she sank the French passenger steamer *Guadeloupe,* from Buenos Ayres to Bordeaux. There was more red meat aboard and plenty of ham, butter, white flour and canned vegetables. She seized it all. Some of her crew were complaining of swollen ankles and pains in the nerves of the legs below the knees. Otherwise they seemed able to eat, sleep and work, and apparently no plague was in sight, for there still remained to them plenty of meat, lots of potatoes and enough white bread and butter to last seemingly forever.

March 25th, 1915, with fifty of her men acting "queerly" and none of them any too vigorous, she sank the British steamer *Tamar,* from Santos to Havre, with sixty-eight thousand bags of green coffee, seizing all her butter, lard, white flour and canned vegetables.

She did not heed the fact that there is a balance of acid and base-forming elements in the "ash" content of all food.

She did not heed the fact that in the food she seized, the base-forming elements had all been processed out.

She did not heed the fact that after a diet of refined food a mild chronic acidosis is set up which abstracts the lime salts from the fibrous tissues, muscles, nerves, cartilages and bones. When the limbs of the German sailors began to swell they did not know that the swelling was due to the abstraction of these lime salts with the increased vascularity which follows.

They did not heed the fact that loss of lime salts causes irritability and weakness of the muscles with neuralgic pains. They did not know that the continued loss of lime salts causes effusion into the joints.

They did not know that following these stages in the progress of acidosis the cartilages soon become involved and that this condition is in turn followed by thinning and erosion.

They were consuming enormous quantities of the refined foods of high caloric value now so extensively relied upon throughout the United States and they looked in all directions for the cause of their trouble but the right direction.

They did not know that the abstraction of lime salts is a cause of the rapid progress of tuberculosis. They simply continued to raid as long as any strength remained in their fanatical bodies.

March 27th, 1915, they sank the British steamer *Coleby,* bound from Rosario to St. Vincent with another cargo of whole wheat. They took her coal, white flour, butter, potatoes and canned vegetables, but sent the precious wheat to the bottom.

Alarming conditions began to develop. Typical symptoms of paralysis, dilated heart, atrophy of muscles and pain on pressure over nerves, with anemia, were marked. Fifty of the men could not stand on their feet. They were dropping at the rate of two a day. It seemed that a curse had descended upon the cruiser and it was plain that the whole crew was rapidly going to pieces.

The *Kronprinz Wilhelm* would either be manned by five hundred dead bodies in a few more weeks or she would have to make a run for it to the nearest port. Her wireless had told her that

Newport News had given harbor to the *Prinz Eitel* (Attila) *Friedrich*. She would take a desperate chance against the enemy and make a dash. April 11th, 1915, having been out 255 days, she made that dash.

§ 61—AMERICAN MEALS

That is why the German cruiser lay at anchor in the James River, a floating wreck, a hospital ship, a lesson to the American experts who cry "beri-beri and polished rice," when red meat and white bread are the real issue. Their scientific murmurings only serve to further mislead the American people and cloud refined food in a maze of professional ignorance. Of course there really is a disease called beri-beri that really is caused by polished rice, but there is no rice connection between the acidosis of the *Kronprinz Wilhelm* and the beri-beri of Billibid Prison.

Here was a crew of men living in the open air, eating the staple articles of diet for which the American scientists claim so much. Fresh meat, all the fat and cheese they could eat, boiled potatoes, canned vegetables, condensed milk, sugar, tons of fancy cakes, biscuits and white bread, and all the coffee and tea they could drink constituted their diet.

"But if German sailors eat typical American meals for two hundred and fifty-five days and develop on that diet of white bread and meat a condition of malnutrition that has resulted so disastrously, why do not the Americans themselves develop the same conditions?" you ask.

Americans do develop the same conditions, but because they eat many other offsetting foods, which were outside the reach of the German sailors, the severity of the condition is modified accordingly.

On the *Kronprinz Wilhelm* the intensity of the cause determined the gravity of the effect. There was no outside assistance in the form of offsetting fresh vegetables and fruits or whole grain foods to lessen that intensity. The canned vegetables consumed, although theoretically contributing base-forming elements, were consumed in comparatively small quantities.

Their juices, contaminated to some extent with salts of tin and sheet iron, acted possibly as an irritant to the kidneys, already taxed beyond their capacity with excess quantities of sulphuric, phosphoric and amino acids, elaborated in the digestion of high protein and refined carbohydrate foods.

Americans before the war, as far as they could afford, ate more or less generously of onions, lettuce, asparagus, cabbage, carrots, parsnips, cauliflower, Brussels sprouts, celery, apples, berries, oranges, grapes and other base-forming foods, all of which assist Nature to combat or to modify some of the evil effects of the refined diet on which the Germans attempted to thrive for a long period.

Thousands of children of the poor in the United States have always been like the crew of the *Kronprinz Wilhelm*. During the era of high war prices they have been more than ever like that crew. They do not now obtain these offsetting foods in adequate quantities, and in the case of adults there are thousands who, making improper choices, deprive themselves needlessly of these offsetting bases.

In the meantime the condition of acidosis does progress sufficiently to interfere with the growth of the young and to rob the body of the adult, through lowered vitality, of its natural defence against disease. It imposes a tremendous handicap upon pregnancy and lactation. It predisposes to tuberculosis, pneumonia, appendicitis, measles, meningitis, constipation and cancer.

It does not pile up its woes in a heap as was done on the German cruiser. It spreads them out thinly over a larger area and provokes many preventable ills.

The *Kronprinz Wilhelm's* experience should be illuminating to Doctors Dufour, Giroux, Quirin and Rudolf, who have reported on the outbreak of war nephritis and trench edema, but they probably have never heard of the *Kronprinz Wilhelm* and her trouble.

The lesson of the *Kronprinz Wilhelm* is this: She has proved almost conclusively the inadequacies of the very foods on which America relies so heavily for the protection of her troops, as well as the protection of her so-called middle and lower class civilians.

No prolonged experiments had ever been conducted to deter-

mine the evil result of living exclusively on such foods. The *Kronprinz Wilhelm* furnished that experiment.

There can be no greater or more picturesque proof of the folly of unbalancing food by refinement, of the folly of ignoring the meaning of the salts, colloids and vitamines natural to all unprocessed foods; of the folly of claiming for high caloric foods the absurd virtues they do not possess.

With Dr. Perrenon, the ship's surgeon, I went over all these points, and many more, treating them in detail. I did not suggest to him that it was beri-beri which had so tragically affected his men, for the reason that the cure for beri-beri, pellagra, acidosis, nephritis, edema and scurvy is the same. It consists in restoring by unrefined foods to the sapped body the bases stolen from it.

Dr. Perrenon asked me to write a formula for feeding his stricken men. I did so, left him an article I had written on the subject and returned to New York.

Then came the following response in writing:

"With respect to the disease we have on board we are satisfied now that this condition is due to the impoverished character of our food supply. The remedy you have suggested is obviously the correct one and I shall immediately order its application. I shall read your monograph studiously.

"E. Perrenon,
"Chief Surgeon, S. S. *Kronprinz Wilhelm.*"

The formula which it was my privilege to suggest, after all medical treatment had failed, and the extraordinary result which followed its application, will constitute the final chapters of this dramatic, and, at the same time, truly scientific episode.

§ 62—GERMAN RESULTS

What was the cause of the breakdown aboard the *Kronprinz Wilhelm,* and what was the nature of the remedy which, after all medical treatment had failed, restored the broken men to health?

From the ship's cook, with the chief surgeon's assistance, I obtained the following chart, showing just what each meal consisted of prior to the breaking out of the disease described by the scientific men as "beri-beri." The chart, explaining the origin of the disease that caused the collapse of 110 of the crew of 500 in 255 days, and was taking off the others at a rate which promised that the entire crew would be down in two weeks, tells just what was behind the beri-beri, acidosis, neuritis, jail edema, trench edema, war nephritis, pellagra, or whatever term is adopted to describe the sufferings of the men.

MONDAY

Breakfast

Cheese, oatmeal, condensed milk, white bread, butter (oleo), coffee, sugar.

Dinner

Pea soup, canned vegetables served in juice that stood in cans, roast beef, boiled potatoes, white bread, coffee, condensed milk, sugar.

TUESDAY

Breakfast

Sausage, white bread, butter (oleo), fried potatoes, coffee, condensed milk, sugar.

Dinner

Potato soup, canned vegetables served in juice that stood in cans, pot roast of beef, boiled potatoes, white bread, butter, coffee, condensed milk, sugar.

WEDNESDAY

Breakfast

Corned beef, white bread, butter (oleo), fried potatoes, coffee, condensed milk, sugar.

Dinner

Beef soup, roast beef, boiled potatoes, white bread, butter (oleo), coffee, condensed milk, sugar.

THURSDAY

Breakfast

Smoked ham, cheese, white bread, butter (oleo), coffee, condensed milk, sugar.

Dinner

Lentil soup, fried steak, fried potatoes, white bread, butter (oleo), coffee, condensed milk, sugar.

FRIDAY

Breakfast

Boiled rice, cheese, white bread, butter (oleo), fried beef, coffee, condensed milk, sugar.

Dinner

Pea soup, salt fish and pot roast, boiled potatoes, canned vegetables served in juice that stood in the cans, white bread, butter (oleo), coffee, condensed milk, sugar

SATURDAY

Breakfast

Corned beef, cheese, fried potatoes, white bread, butter (oleo), coffee, condensed milk, sugar.

Dinner

Potato soup, roast beef, boiled potatoes, white bread, butter (oleo), coffee, condensed milk, sugar.

SUNDAY

Breakfast

Beef stew, cheese, fried potatoes, white bread, butter (oleo), coffee, condensed milk, sugar.

Dinner

Beef soup, pot roast, canned vegetables, served in juice that stood in the cans, boiled potatoes, white bread, butter (oleo).

At four o'clock every afternoon the men were served with a plate of Huntley & Palmer's fancy biscuits or sweet cakes with coffee, condensed milk and sugar.

SUPPER

Evening meal consisted either of fried steak, cold roast beef, corned beef hash, beef stew with potatoes or cold roast beef with white bread, butter (oleo), coffee, condensed milk and sugar.

The raids, which resulted in the sinking of so many French and British merchantmen (fourteen), yielded, as we have seen, enormous quantities of coal for fuel, enormous quantities of fresh beef, white flour, sugar, oleomargarine, potatoes, cheese, condensed milk, white crackers, sweet biscuit, coffee, tea and sugar, with considerable quantities of canned vegetables, ham, bacon, beans, peas, beer, wine and spirits.

The raids never resulted in any large quantity of fresh vegetables or fruits. If such fresh vegetables and fruits as were confiscated had been divided among the crew they would not have sufficed for more than one day. In consequence they were reserved for the officers' table, which they managed to provide with fair quantities from one raid to another.

All the officers showed symptoms of anemia and mild acidosis, but none of them was prostrated. From their tissues and blood the lime, iron and potassium had not been robbed to the degree suffered by the tissues and blood of the men.

The formula, designed to restore these lost salts which it was

my privilege to suggest to the ship's chief surgeon, and which was followed by him after it became evident that the men would not respond to medication, was as follows:

"To one hundred pounds of wheat bran add two hundred pounds water. Leach for twelve hours at one hundred and twenty degrees Fahrenheit. Drain off liquor. Give each man eight ounces each morning.

"Give each man one teaspoonful wheat bran, morning and night, until contra-indicated by loose stools.

"Boil cabbage, carrots, parsnips, spinach, onions, turnips together two hours. Drain off liquor. Discard residue. Feed liquor as soup in generous quantities with unbuttered whole wheat bread.

"Wash and peel potatoes. Discard potatoes. Retain the skins. Boil skins and give liquor to men to drink four ounces a day.

"Give to each man yolks of four eggs a day in fresh, sweet, unskimmed milk, one yolk every three hours, with as much milk as he will drink by sipping.

"At noon, with dry whole wheat bread, give one ounce fresh roast beef, for the psychological effect upon the men who have been taught to believe that without meat they cannot live.

"One hour before drinking milk give juice of ripe oranges or lemon juice, diluted with water without sugar, to each man.

"Keep apples or apple sauce within reach of men all the time.

"At end of first week let the men eat solids of vegetable soup as well as liquor.

"It is imperative that the men shall avoid all cheese, whites of eggs, lard, fat of any kind, white bread, crackers, pastry, puddings, mashed potatoes, sugar, saccharine, salt meat, fish, polished rice, pearled barley, degerminated corn meal and gravy (acid-forming foods)."

Aboard the cruiser we have a diet of typical American foods which, as to its adequacy, completely satisfies the standards of the modern scientist.

At the end of two hundred and fifty-five days we have a disease of "mysterious" origin. To top off these conditions we have what appears to be the most outlandish and ridiculous corrective diet ever proposed. What then is the explanation of the

seemingly well-balanced diet which went wrong, and of the apparently foolish diet which went right?

Certainly it was the duty of scientific men to keep the crew of the *Kronprinz Wilhelm* under surveillance that the effects of their extraordinary dietetic experience might be properly interpreted for humanity at large.

If exclusive feeding on white bread, butter, potatoes, fresh meat, canned vegetables, sweet cakes, tea, coffee, condensed milk and sugar with a little rice, a few beans and an occasional piece of ham, is followed by any consequences at all, the experience of the *Kronprinz Wilhelm* afforded an opportunity to determine what those consequences are.

The Kaiser's sailors were crippled. They were subsequently put back on their feet. Their sufferings and the result of their sufferings demonstrated at last to the American people the alarming inadequacy of the most typical American foods.

Out of the crew of five hundred the one hundred and ten who had reached the limit of toleration on the two hundred and fifty-fifth day had gone right up to the breaking point. The other three hundred and ninety had not completely collapsed. They were merely on the verge.

Prior to the sudden prostration of these victims of demineralised food none of them had any suspicion that he was about to be stricken, but those who through pain and exhaustion finally realised the gravity of their condition, were now prepared to submit to heroic treatment, however absurd it might appear. Yet the men who were still able to walk the deck possessed no adequate conception of the gravity of the slow moving, insidious attack which their typical American foods had made upon their tissues. Like most of us they were the victims of habit which they were reluctant to change.

None of them realised that the secondary consequences of acidosis, even of its milder forms, are more dangerous than nervous prostration, neuritis, edema, beri-beri, or whatsoever other terms is employed to describe malnutrition.

None of them cared a sailor's knot about the function performed by the alkaline salts necessary to neutralise the acid end-products of a meat and white flour diet.

They were not interested in the fact that meat as dressed for

human consumption is stripped of its bones and drained of its blood, and therefore does not furnish the alkaline substances upon which the normal alkalinity of the internal secretions depends.

They were not worried about the fact that in the ordinary meat-containing diet, man to some extent offsets the acidosis that follows such diet by consuming milk, egg yolks, celery, lettuce, spinach, carrots, parsnips, beets, cauliflower, onions, string beans, asparagus, apples, oranges, berries, and other fruits and vegetables.

They were not interested in the fact that acidosis, even of the mildest type, is the forerunner of tuberculosis and other diseases, which follow in the wake of lowered vitality.

They were too busy sinking ships to bother with the fact that acidosis is the most relentless calcium destroyer now engaged in breaking down human tissue.

They had never heard of Scandola, who has demonstrated that nothing promotes the elimination and loss of calcium more than the use of decalcified foods, such as white bread, degerminated corn, sugar and meat.

To them the work of Drennan, indicating that the withdrawal of calcium may cause a fatty infiltration and fatty degeneration of the liver cells, meant nothing.

They had too much to do to worry over the proofs that where the calcium supply of the blood is diminished the blood will not coagulate on demand, and that after a diet deficient in calcium post-mortem examination shows hemorrhages even in the long bones, thus revealing the hidden ravages that progress unseen until too late to be averted.

They were eating foods not only deficient in calcium but deficient in the other mineral salts that accompany calcium, but they had no thought of the fact that where the mother is deprived of a sufficiency of calcium foods the fetus is handicapped by lime deficiency, its bones do not grow properly, its teeth do not erupt normally, and later they quickly decay.

That their own diet had been robbed of calcium for purely commercial reasons meant no more to them than it now means to the Americans who also ignore it.

For many years it has been known to the medical profession

that the auto-intoxications or acid intoxications known as acidosis can be experimentally produced on a diet free from the alkaline salts.

The sailors of the *Kronprinz Wilhelm* cared no more for this truth than does the American public. For many years it has been known to the medical profession that Nature, attempting to neutralise these acid conditions, sets up a process in which ammonia is withdrawn from the urea to such an extent that the quantity of "acetone bodies," acetone, diacetic acid, and beta-oxybutyric acid can be gauged by it, and that these acetone bodies are found in many diseases, including diabetes.

Did these facts have any significance for the raiding sailors of the *Kronprinz Wilhelm?* They did not.

Ott and Crofton have shown that twenty times the normal quantity of calcium salts is excreted in tuberculosis, but the sailors cared no more for that than they cared for the fact that the complete withdrawal of calcium destroys the defence of the tissues not only against the invasion of the tubercle bacilli but against the assaults of many other diseases; that a normal food calcium content is indispensable to human life.

That foods not processed or refined provided this normal calcium content meant nothing to the crew of the *Kronprinz Wilhelm,* who for two hundred and fifty-five days suffered such a loss of calcium that they established with considerable precision the fact that two hundred and fifty-five days constitutes approximately the maximum length of life on a diet of such demineralised or decalcified food.

§ 63—THE "KRONPRINZ WILHELM" CURE

The German sailors were not concerned with the fact that demineralisation or refinement of foodstuffs involves not alone the loss of calcium but also the loss of all other "ash" constituents of normal food, such as potassium, iron, magnesium, silicon, fluorine, iodine, etc., and the other substances, fat soluble "A" and water soluble "B," found in leaves and grasses, and the germ or fat containing substances of cereals, each of which per-

forms a function in the economy of nutrition no less picturesque or important than the rôle played by calcium.

It was certain that if removed from the German cruiser to a hospital and subjected to the conventional hospital treatment, including tea, white toast, white bread, butter, cornstarch pudding, farina, cream of wheat, mashed potatoes and chops, all of the victims of the *Kronprinz Wilhelm* would have been doomed to tuberculosis, if tuberculosis had not already taken residence in their tissues.

Their only hope of complete restoration to health, which meant complete repair of all the damage already done, and a return of nutritional immunity against disease, lay in a prolonged diet of food containing an excess of base-forming elements and a deficiency of acid-forming elements.

This was the idea responsible for the "crazy" dietetic treatment I was permitted to suggest to the ship's surgeon, and which he applied with results that speak for themselves.

It was clear that the tissues of the stricken men hungered for alkalines of vegetable origin, and that these alkalines had to be supplied.

It was also clear that there was no better way of supplying them than by saturating the tissues with fluids containing them in solution. All the foods proposed, particularly the vegetable liquors, were rich in alkaline salts. That is why the potato skins were employed.

I was convinced, and Dr. Perrenon agreed with me, that inasmuch as the men had failed to respond to every other treatment, it would have been wrong to withhold the alkaline treatment, even though it might be laughed at in high places.

We know that April 11th, 1915, the stricken men aboard the cruiser numbered one hundred and ten.

April 12th, two new cases were reported.

April 13th, one new case was reported.

April 14th, four new cases were reported.

April 15th, three new cases were reported.

April 16th, the men began to be saturated with soluble alkalines of vegetable origin, to neutralise as quickly as possible the acidity of their internal secretions, and the toxins poisoning them.

April 17th, 1915, no new cases were reported, and Dr. Perrenon expressed great confidence in the treatment.

April 18th, no new cases were reported. Many of the more recent cases manifested marked improvement. In eighteen cases the swelling in the ankles subsided, and in a number of cases it was marked that the pain on pressure over the nerves was not so acute.

April 19th, four men were so much improved that Dr. Perrenon permitted them to go on deck. Many others showed signs of improvement.

April 20th, fourteen men were able to leave the ship's hospital, and return to their own bunks.

Dr. Perrenon said: "The effects of the new treatment are remarkable."

April 21st, eight men were dismissed from the ship's hospital.

April 22nd, eight more were dismissed.

April 23rd, four more were so much improved as to be pronounced out of danger.

April 24th, seven more cases were dismissed from the hospital, and one of the completely paralysed victims could stand on his feet without help.

Ten days had passed and forty-seven men were so far advanced toward recovery that Dr. Perrenon said: "We can safely say they are cured." The phenomenon was so striking that I had again journeyed to the vessel to be an eye-witness of it.

Dr. Perrenon escorted me on the tenth day to one of the worst cases, that of a sailor who spoke English well. He was the second man aboard to collapse, going down in January, 1915. After a diet from the officers' table he recovered until February 23, when he again went down.

When I visited the ship for the first time Dr. Perrenon thought the man might die. When I saw him on the tenth day he said: "I have had three days without pain. I am now hoping to be well."

I examined him with Dr. Perrenon. The swelling of his legs had subsided, but the pain still existed when pressure was applied. His condition was indeed pathetic.

"You know you owe this to white bread and meat," I said to him. "Yes," he answered, "my case is the worst, but the other

cases are bad enough. We all owe it to white bread and meat, but there will be no more such food in the German Navy when they know what happened to us. They will profit by this, all of them."

I wondered then whether his words were prophecy, but so far their application in America reveals nothing prophetic about them.

Returning to Dr. Perrenon's headquarters, after visiting the men, he brought out his history of all the cases, each of which is complete, with an exhaustive record of all the symptoms, including the date on which each man was seized.

In January there were two cases.

In February, the 23rd and 25th, there were two more.

In March, the 4th, 16th, and 25th, there were three.

In April the men went down like ten-pins, and they continued to go down until their prolonged mineral fast was broken by the strangest prescription ever written.

"What can American scientists do in the presence of such a crisis?" I asked Dr. Perrenon. "They can bow their heads," he said.

"Will they not find some way to explain the situation that will still show the world that their knowledge of disease is ample, and the present habits of the people no real cause for anxiety?" I continued.

"Some of them may be big men," he replied. "Big men will accept the truth no matter where they find it. As for me, my record is complete. Our German authorities will not let it escape them. Our experience will not be lost to Germany."

He pointed significantly to the written records in his hand, and patted them affectionately, as if he realised their priceless character.

The *Kronprinz Wilhelm* was putting on coal as if she were making ready for another dash to the sea. "But what will happen if you run the gauntlet again and are pursued and——" I did not finish the sentence. He looked at me. There was a pause. Then he spoke.

"If we should be lost and our records destroyed a hundred of your American physicians and other authorities have seen the cases. The effects of the remedy have also been seen. I think

nothing can happen——" It was his turn to leave a sentence hanging in the air unfinished.

Summing up the experience of the *Kronprinz Wilhelm* prior to her appearance in the James River, Dr. Perrenon said: "We had many cases of pneumonia, pleurisy and rheumatism among the men. They seemed to lose all resistance long before the epidemic broke out. We had superficial wounds, cuts, to deal with. They usually refused to heal for a long time. We had much hemorrhage. There were a number of accidents aboard, fractures, and dislocations. The broken bones were slow to mend. Nature was not doing her duty. Food is indeed the cause of much disease. In nine months we can learn much that is not to be found in the text-books."

At 5:30 P. M., Saturday, April 24th, 1915, Dr. Perrenon was ordered by his superiors to repress all facts concerning the conditions aboard the vessel. He would not admit that Bernstorff issued the orders but I was led to believe as much.

I left Newport News at once for Washington, where I reported to Congressman Walter M. Chandler, who escorted me immediately to the headquarters of Surgeon-General Blue.

"Apart from all considerations of public policy or official recognition of unofficial but well corroborated facts," said the congressman, "there is an element in this *Kronprinz Wilhelm* situation which demands the recognition of this government and the profound attention of its experts."

Surgeon-General Blue, after learning in detail the facts reported here, turned us over to Dr. Arthur H. Glennan, acting surgeon-general, and Dr. J. W. Kerr, chief of the Research Laboratory.

Drs. Glennan and Kerr grasped the situation instantly. The magnitude and significance of the incident were obvious. The general bearing on the welfare of millions of growing children in America, who rely with profound confidence on the wholly inadequate foods which figured so largely in the general breakdown of the crew of the German raider, was clear to them.

By their admissions they indicated they realised that perhaps they really were on the peak of a newer and wider outlook upon the sadly neglected field of food research.

In minute detail they reviewed with me the work of Drs. H. C.

Sherman and J. Edwin Sinclair, reported by them as far back as 1907 from the Havemeyer Laboratories, Columbia University, in connection with those foods that contain an excess of acid-forming elements as compared with other foods containing an excess of base-forming elements, or alkaline ash.

They noted the conspicuous fact that in the dietary of the German seamen the alkaline bases were distinctly absent, and that their food was almost totally deficient in these indispensable elements.

They noted that Sherman's and Gettler's research revealed nearly every one of the foods on which the Germans subsisted for two hundred and fifty-five days to be of the type that contains an excess of acid-forming elements.

That the Germans responded almost instantly to a diet rich in alkaline ash was obviously significant.

That forty-seven men should be dismissed from the ship's hospital within a period of ten days, following the ingestion of fresh vegetable soup, potato-skin liquor, wheat bran, whole wheat bread, egg yolks, whole milk, orange juice and apples, was worthy of notice.

That no drugs were administered, and that all fat, egg albumen, cheese, meat, white flour and sugar were withdrawn from the crew's diet, was worthy of notice.

That conflicting stories had already made their appearance in the American press, concerning the kind of food consumed by the Germans, was also worthy of notice.

"An investigation now," they said, "depends upon the courtesy of the German government in permitting us the privilege of making an extended study of the situation. We cannot, of course, invade the ship, and would not dream of doing so if we could. Doubtless a request from the Secretary of the Treasury to this department to study the situation would be followed by the permission of the commander of the vessel to our men to probe the facts."

We were not then at war with Germany, but our Government did not probe the facts. When we later went to war with Germany, the facts not only affected our physical power to deal with Germany in the trenches, but they also affected the productivity of our civilian population at home.

They now affect our second line of defence, the child.

The *Kronprinz Wilhelm,* a German raider, taught us a truth which to some degree may have helped the Germans, just as our American inventions—the submarine and the aeroplane—helped them.

As far as America, England and France are concerned, the *Kronprinz Wilhelm* episode had no significance.

God's laws, so easily discerned, remain ignored.

§ 64—THE HEIGHT OF CHILDREN CUT DOWN

The report of the Health Commissioner of New York City for January, 1918, showing the complete loss in Manhattan and Brooklyn in one month of 18,000,000 pounds of fruit and vegetables, including pineapples, oranges, potatoes, onions, string beans, squash and turnips, only serves to emphasise the fact that in America we do not hold our public officials responsible for failure.

Here was food of the very kind the people needed most, yet it was allowed to perish because authority to avert the catastrophe had been centralised in nobody.

In Great Britain they kick a prime minister down stairs, throw a cabinet out of doors, and hoist a general upstairs when results do not suit them.

In France the political career of a world-famous official is chloroformed over-night and in dire extremity the English submit to a French generalissimo.

The Prussian government, finding the efficiency of this or that professional murderer on its staff not sufficiently horrible, appoints another official murderer.

In America we handle our worst bunglers, our most selfish, inefficient and inactive officials and politicians, our most useless servants, with deference and sloth. We criticise them day in and day out, but rarely hold them responsible. There is nothing superlatively American in that.

In all our expenditure of money and all the beautifully carved planks of our political platforms, we have ignored the child.

The well-laid plans of Germany for an enormous army included for many years the expenditure of vast sums to promote the health of children.

France, facing a declining birth-rate, began the supervision of the health of school children back in 1842, and was the first to establish milk stations in 1892.

Going further than this, but for self-preservation alone, France enacted laws governing the employment of expectant mothers, and created a money subsidy for mothers who nursed their babies.

In America the Department of Agriculture, spending millions of dollars annually, has played politics with food industries, with the packers and their agents, with special privileges, with manufacturers and distributors, and while issuing hundreds of thousands of bulletins, has permitted the standards on which child welfare is founded to be lowered right and left.

The facts, for the very safety of America, should inspire a congressional review of the Department of Agriculture similar in scope to the probe made by the Federal Trade Commission, 1917-1918, into the affairs of the packers.

In confirmation of the disclosures paraded through these pages, Dr. Thomas D. Wood, professor of physical education, Columbia University, declared early in 1918 that the war had already brought to America as well as to Europe an increase in ill health, due to under-nourishment among children, a fact all the more alarming because it strikes at the very foundation of childhood, burdening the future citizen with a handicap to be carried throughout adult life.

Dr. Lucas, examining the poorly nourished war children of Belgium, to whom hundreds of shiploads of American white flour were fed by the Belgian Relief, found tuberculosis and rickets had increased to such an extraordinary extent that the hospitals and sanatoriums, supplemented with many additional clinics, were wholly unable to care for the cases.

In France and England tuberculosis among children, due to undernourishment, first doubled during the early years of the war and then quadrupled. Even the height of children during the growing period between twelve and fifteen years of age was cut down one and one-fifth inches, and the older children who had

finished their growth as far as height was concerned, according to Dr. S. Josephine Baker, suffered an appalling loss of vitality due to underfeeding.

The increase in wages in 1918 did not offset the decrease in the buying power of the dollar, and Dr. Baker declares from her specialised investigations that "never before have our children been so underfed or so lacking in vitality."

"There is no actual starving among them, it is merely a question of habitual underfeeding, the real significance of which is lessened resistance to disease.

"Such underfed children will not only contract the diseases of childhood more readily, but they will be the first to fall victims of tuberculosis."

Neither the Department of Agriculture nor the Food Administration attempted to avert the destruction of the millions of pounds of food which these undernourished children required, but which they did not obtain.

The Department of Agriculture is on record to the effect that it knows how to avert these tragedies. Surely the results of our sloth are sufficiently visible to inspire the application of this knowledge.

We know, for instance, that during the first six months of 1915, two years before we entered the war, of 11,000 applicants for enlistment in the United States Marine Corps only 365 were considered physically fit.

The report of the surgeon-general of the Navy for 1916 shows 70 per cent. rejections for the Navy and Marine Corps. Of 278,537 applicants for enlistment in the army between 1914 and 1917, 205,281, or nearly 74 per cent., were rejected at the recruiting offices because of physical defects, apparent even to observers who had no medical training. Even a red light is recognised as a danger signal and when we see it we promptly heed the ditch, but we saw no danger signal in these rejections.

At the recruiting depots where the men were subjected to more rigid examinations, an additional 10,062 were rejected, a total of nearly 78 per cent. Nobody asked the cause.

It is now known that fully 10 per cent. of all our boys were thrown out because of underdevelopment, no surprise to those

familiar with the conditions existing among our school children.

All these rejects had all the red meat and white bread they could eat. They had all the corn flakes, corn starch, biscuits, pancake flour, syrups, degerminated corn meal, polished rice and patented breakfast foods they could consume. Yet the policy of the Department of Agriculture and of the Food Administration was not to interfere with business or the established order of things.

It was enough for their purpose to get stuff labelled food regardless of whether it was adequate food or not. It was the easiest solution of a truly heroic problem, but the easiest way is usually not the best way.

According to the Food Administration's policy the quality and adequacy of food received no attention, but it was of paramount importance that commercial interests should in war time make their pre-war normal profits, for the reason that in Herbert Hoover's belief, although no one should make any profit out of war, he held that as an economic system the country could not revolve twenty-four hours without it.

This statement, never published in the newspapers, is found on page 933 in the testimony of Herbert C. Hoover at the hearings before the sub-committee of the Committee of Manufacturers, United States Senate, Thursday, January 3, 1918.

In the light of the neglected facts which our many war activities completely submerged, it is manifest now that we must heed the pressing truth.

Mere tonnage, bulk and volume may suffice for a time, but if at the root of the nation undernourishment is permitted to gnaw, all its heroic efforts must result in ghastly failure.

General Pershing himself, in February, 1918, manifested no little solicitude with regard to the food supply of our forces in France. A despatch from his headquarters informed us that on an inspection tour he asked the boys if they were getting enough to eat.

It was not generally known in America at the time that a disease called war nephritis was prevalent as an epidemic among French and British troops, as well as among those of the Central Powers.

The Canadian Medical Association in April, 1917, reported the frequency of war nephritis among the troops, declaring that the disease was the subject of an investigation in the military hospitals at the front.

In 1916 "Bulletin et Memoires de la Société Médicale des Hospitaux," Paris, published the report of Dufour, Giroux and Qurrin on war nephritis, which substantially agreed with the findings reported by Rudolf of the Canadian Hospital Service in France.

The medical observers declared that the disease was due to a limited diet, "particularly a too exclusive consumption of meat."

The most significant symptoms of the disease are described as edema, which yields to a milk diet. Considerable vomiting, severe headache, roaring in the ears, difficulty in breathing and increased blood pressure accompanied the edema.

These symptoms are identical with the poison squad white bread and meat symptoms heretofore reviewed.

Immediately after the outbreak of war in 1914, I was called into consultation by the Belgian Relief and asked to devise a formula to cover the purchase and shipment of supplies for the stricken victims of Prussian violence.

I submitted all the facts concerning the dangers of a white flour diet that up to that time had been determined by various government agencies. I made recommendations accordingly.

These recommendations were not acted upon.

Why were they not acted upon? Why are they not acted upon now?

White bread has not saved the children of Belgium. It has not saved the children of France and England. It has not saved the children of America.

If the governments of the United States, France and England were not already in possession of data proving that the whole grain contains substances not found in the refined grain, the tragedy symbolised by war nephritis among the troops could be properly charged to invincible ignorance, a state of darkness which is at the root of so many miseries suffered by the human family, but our own government has spent thousands of dollars to determine the facts, all of which are on file in the archives of the United States Public Health Service at Washington, even

though they were not utilised by the Department of Agriculture, the Food Administration, or the Quartermaster's Department.

We now know that the manufacturers of patent flour are on record with the assertion that they vigorously opposed all efforts of the Department of Agriculture and the Food Administration to interfere with the white flour milling process, asserting in their defence that they insisted properly upon the retention in their refined product of all the elements of the grain "fit for human food," and the rejection of all the elements of the grain "unfit for human food."

If they really believe that their discarded substances are unfit for human food, why do they advertise some of them so extensively even in the medical journals as "most fit," "most necessary" and "most indispensable" to human health, after appropriating enormous advertising funds for the exploitation of their fancy by-product packages?

§ 65—DONALD B. MCMILLAN'S FOOD

No wonder in March, 1918, from behind the American front in France, through an Associated Press despatch, came the announcement that "for a time our troops had to eat dark bread, but now they receive an ample supply of pure white bread."

The commercial influences, working in America for white bread, had made American officials in France believe that white bread was superior. They did not suspect that bread made of wheat bled white might be a tremendous aid to the enemy.

They had never heard of the experience of Donald B. McMillan, leader of the Croaker Land Expedition, 1913-1917.

They had never heard of the similar experience of Roald Amundsen, leader of the Norwegian Antarctic Expedition in the *Fram,* 1910-1912.

The *Fram* crew knew nothing of white bread. Not a man was ill for an hour, yet they faced colossal hardships for two full years upon a diet of pemican, consisting chiefly of oatmeal

and dehydrated vegetables, with a little dried ground meat and oat biscuits made of whole oat meal and milk powder.

Thursday, December 6, 1917, from Donald B. McMillan in his office, American Museum of Natural History, New York City, I obtained the extraordinary record of his dietetic experience. Its significance is of priceless value to the entire world.

"Four years of eating whole wheat biscuits, whole wheat bread, chocolate, dehydrated fruits and vegetables," he said, "surely ought to constitute a very thorough test of the nutritive value of these foods. Just such a prolonged test has convinced me that I could live indefinitely even in the Arctic upon such foods. My own experience has confirmed my conviction that they are truly ideal for the use of all explorers and expeditionary forces."

In spite of the vicissitudes of his long struggle with the elements, McMillan was unchanged in appearance. During his long absence he suffered no loss in health, weight, vigour or strength, and what he says is of moment to us in this hour of intensified endeavour, the rugged demands of which have nothing in common with that delicate substance—bread bled white.

McMillan sailed from the Brooklyn Navy Yard on the ill-fated steamship *Diana,* July 5, 1913. At one period during his four years' absence the world gave him up for lost. But the world is richer, immeasurably richer, as a result of his return to civilisation with the fruits of his inspiring adventure, fruits which I reverently pray America will not refuse to eat.

Here are his words as they were taken down by my friend, E. H. Tunnison, an earnest disciple of food truth:

"Perhaps Small and I of our original party of seven were the only two who remained in the Arctic for the full term of four years. I believe, therefore, that we two have been subjected to a diet test longer than any other human beings whose experience has been recorded.

"Eckblaw, who returned to South Greenland in 1916, with Danish officials, and Small, ate ships biscuits until our stock of them was depleted, after which they were forced to eat dog biscuits composed of inferior ingredients, in some instances horse meat. The dog biscuits did not seem to disagree with them."

(The Bennett dog biscuits are made from meat and whole wheat).

"The Eskimaux, both parents and children, are very fond of dog biscuits. They are also fond of whole wheat biscuits. When we left for home we gave them three hundred pounds of whole wheat biscuits which still remained among our supplies.

"I ate the whole wheat biscuits exclusively, although by the end of the last year they had become very hard and irritated my mouth slightly when I chewed them.

"They had been baked specially for our use, and at my request had been made harder than usual because of the natural tendency of biscuits to become soft and crumbly. Our cook soon devised a way to remedy the unexpected defect of extreme hardness. He placed them in a canvas bag and beat them with a hammer until they were pulverised. He then added a little flour and converted them into appetising loaves of bread.

"During the entire period I suffered no disturbance either of digestion or of intestinal action, due, I believe, to the use of the whole wheat.

"When I was with Peary on his trip to the North Pole in 1909 it was the common experience of all of us to suffer from bleeding intestines.

"Peary believed in beef, suet and raisins, tea, ships biscuits (white flour) and condensed milk. He took with him 10,000 pounds of white flour, 1,000 pounds coffee, 800 pounds tea, 10,000 pounds sugar, 7,000 pounds bacon, 10,000 pounds white biscuit, 100 cases condensed milk, 30,000 pounds pemican, 3,000 pounds dried fish.

"I took with me 5,000 pounds whole wheat biscuits, 2,000 pounds whole wheat flour, 1,080 pounds dehydrated vegetables, equivalent to 10,000 pounds fresh vegetables, including potatoes, rhubarb, turnips, spinach and onions; 12 cases assorted dehydrated soup, 19 crates yellow-eyed beans, 12 crates pea beans, 150 pounds Scotch green peas, 200 pounds yellow split peas, 1,000 pounds dried apples and apricots, 608 pounds prunes, 300 pounds raisins, 900 pounds chocolate, bitter and sweet, 1,000 pounds brown sugar, 42 cases baked beans, and assortment of nuts, dates, figs, lime juice and grape juice, and a small assortment of canned

peaches, pears, cranberries, apples, cherries, plums, corn, peas, tomatoes and squash."

A casual comparison of the food taken by Peary and the evil results that followed its consumption, with the foods taken by McMillan and the remarkably uneventful results experienced by his party reveals the fact that Peary's supplies, with the exception of the raisins, contained in his pemican, were strikingly deficient in the base-forming or alkaline salts and vitamines so essential to health, strength and endurance.

McMillan's superior judgment in the matter of diet, aided by his observation of Peary's unfortunate experience, enabled him to overcome the deficiencies of the Peary diet with results so striking that the Army and Navy of the United States might well analyse them and appropriate their virtues.

Among McMillan's illuminating observations the following is especially significant.

"We all were most decidedly impressed by the wonderful flavour and invigorating quality of the dehydrated fruits and vegetables. We also ate with gusto the baked beans (rich in alkaline substances).

"Explorers in the past, Kane in 1853 and Scott and Shackelton in 1902, frequently collapsed for the reason that they did not take an adequate supply of foods containing these essential substances. They were deceived by their belief that fresh meat was a suitable preventive of scurvy" (sometimes called acidosis, sometimes beri-beri, pellagra, neuritis, jail edema, pernicious anemia, etc.).

Scurvy is a symptom of impoverished or de-alkalised blood, due to the consumption of acid-forming foods, white flour, meat, sugar.

Scurvy or one of its many kindred disorders always develops when the blood is robbed of its potassium and calcium salts.

These disorders are feared by explorers although they are typical deficiency diseases, practically identical with beri-beri and pellagra, which are not feared at all by the people who stay at home.

Elisha K. Kane, M.D., U. S. N., leader of the second Grinnell Expedition, 1853-1855, a group of Americans who penetrated the polar regions in search of Sir John Franklin, British explorer lost

in the Arctic in 1845, describes in his report of his unsuccessful and costly experience the evils with which malnutrition cursed his heroic and noble effort.

"Not a man now," he wrote, "except Pierre and Morton, is exempt from disease, and as I look around upon the pale faces and haggard looks of my comrades, I feel that we are fighting the battle of life at a disadvantage, and that an Arctic night and an Arctic day ages a man more rapidly and more harshly than a year anywhere else in all this weary world."

Dr. Kane's supplies, though he had the medical knowledge of his time to guide him in their selection, consisted of pemican, biscuits, pickled cabbage and a small stock of American dried fruits and vegetables, which was only too soon exhausted. Had the vegetables held out his men would have been saved.

Following their exhaustion his crew lived upon hard tack (pilot crackers) from which the bran and germ had been foolishly sifted out; stewed dried apples, tea, coffee, sugar and small portions of potato and fat.

Whole wheat would have brightened his melancholy lament, but Kane had never heard of it, although Sylvester Graham, M.D., had tried to make it famous.

As their supplies became thinner, the Kane crew resorted to the use of fresh meat, easily obtained in the Arctic. Meat did not save them. Soon muscular weakness, such as chickens, guinea pigs, white mice and human poison squad subjects experience when fed on white flour and meat, asserted themselves.

The men bled from the nose at the slightest provocation. Their blood had lost the power of coagulation, as all blood does when robbed of its calcium.

McMillan, profiting by his studies of polar adventures, saw to it that his supplies contained an abundance of these salts so grossly disregarded in our American diet.

Shackelton, too, in his "The Heart of the Antarctic," has something to say on this subject. These are his words: "In the first place the food must be wholesome and nourishing in the highest degree. At one time the dread disease scurvy was regarded as the inevitable result of a prolonged stay in ice-bound regions, and even the Discovery Expedition, during its labours in the Antarctic, 1902-1904, suffered from scurvy, but during our entire

trip from 1907 to 1909 we did not develop a single case of sickness, relying almost exclusively upon whole wheat biscuit, dehydrated fruits and vegetables, marrowfat peas, lentils and kidney beans.

"We carried with us dried prunes, peaches, apricots, raisins, currants, apples, dehydrated potatoes, carrots, cabbage, onions, Brussels sprouts, cauliflower, celery, spinach, parsley, mint, rhubarb, mushrooms and artichokes to the extent of 3,800 pounds, with 2,240 pounds of whole wheat biscuit."

Anthony Fiala, commander of the Ziegler Polar Expedition, 1903-1905, says in his "Fighting the Polar Ice":

"The remark of General Grant that an army travels on its stomach, is now a maxim in text books on military logistics."

Fiala's experiences emphasise the truths which all other polar explorers have contributed to the sum total of wisdom under which not alone armies, but civilians and their children, should be fed.

McMillan tells us that he took with him five barrels of corned beef, but did not touch a mouthful of it, and that during the day, between meals, his party stood hunger off by munching upon whole wheat which they carried in their pockets, now and then chewing upon a pilot biscuit or a piece of bitter chocolate.

"When I accompanied Peary," he declared, "our pemican which had been prepared by one of the Chicago packers, was found to contain numerous particles of foreign substance and therefore became useless to us. I made sure to obtain a different kind of pemican when I went North," he said.

I have before me as I write a six-pound tin of the McMillan pemican which he brought back with him from the frozen north.

This experience of McMillan's was not without its significance to Francis J. Heney, who encountered so much organised effort to interfere with his 1917-1918 investigation of the crimes of the packers.

FIVE: AMAZING CONFUSION OF CLINIC AND CLASS ROOM

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§ 66—IGNORING THE COMMONPLACE

We have reviewed the results of hundreds of experiments conducted by scores of investigators working independently of each other upon the problems of nutrition.

We have seen how all efforts to square the academic theories of dietitians with the simplest and most obvious of food facts end in complication and confusion.

This chaos, for it is chaos indeed, broods as frequently in high places as among the plain people. It is largely the result of the materialistic spirit of the twentieth century, now happily undergoing a change.

Men who fondly cherished their intellectual accomplishments as the chief glories of progress and the loftiest pinnacles of civilisation, were prone to ignore the commonplace.

Intellectual pride seemed to develop in them a sort of spiritual astigmatism. In their earthly pursuits they abandoned altogether the old-fashioned idea that God is the author of life, and that all manifestations of life are the expressions of fixed laws.

They forgot that a hen's egg laid in China is identical in physical and chemical properties with a hen's egg laid in Texas, or if admitting the fact, they promptly explain it away in ponderous phraseology.

They forgot that the flavour of the elderberry and the peach are the same to-day as when they were boys; that the seed is always true to type, and that from the acorn springs only the oak.

They forgot that cow's milk produced in the Isle of Guernsey or the state of Delaware is always physiologically the same and that the milk of the normal human mother, whether she be Eskimo, Filipino, Armenian, Spaniard, Turk, Pennsylvania Dutch, Nordic, Alpine or Mediterranean, is always identical in composition.

They did not stop to ponder over this constancy and fidelity of adherence to a never-changing standard, when all human standards about them are changing, even as the colors of the chameleon.

They saw in them nothing of the operation of a divine law.

They failed to note that the first food of every human being is colostrum, and that for the first three days of every normal infant's life the one and only food it requires is colostrum.

They failed to see any active providence in the second food of the normal babe, which suffices it for at least a year.

They could not admit that the appearance of colostrum and milk in their proper turn and at their proper time, without conscious effort on the part of mother or child, is an expression of nature's august obedience to the will of God.

They could not believe that if, as the result of the control of a fixed law, the food of the first three days and the food of the first year of the life of a human being have been pre-arranged and elaborated according to fixed standards, there must also be some similar pre-arrangement and control exercised in the production of the foods that follow during the second, the tenth and the fiftieth years of life.

Such propositions as these they described as mysticism, failing to note that the grasses and the seeds of grasses prescribed in the book of Genesis, are the expressions of a law, and that therefore these grasses and their seeds are to be accepted by man without change, manipulation, modification or refinement, even as colostrum and mother's milk are accepted by the infant without change, manipulation, modification or refinement.

The very thought of refining mother's milk at the breast would be abhorrent to the modern infant specialist. He knows where nature's laws have not been violated through ignorance or caprice, the milk of the healthy mother, just as it is compounded by her tissues, is the one food on which her infant thrives best.

When such milk is examined chemically the reason for this phenomenon becomes obvious, and upon man's understanding of it he bases all his efforts in cases of necessity to modify the next best food for the babe—cow's milk, which must be made to resemble physiologically the milk of the human by a marked change in its protein, fat, sugar and mineral content, in order that it

may be in some measure adapted to the requirements of the infant.

These commonplace phenomena which rarely inspire the serious contemplation of science and never the sonnets of a poet, are not interpreted by materialists as indices of a vast, beautifully ordered and sublimely executed scheme in the creation and maintenance of life and health on this planet.

Science, examining not the whole but its parts, does not as a rule arrive at the conviction that any capricious departure from the normal represents a trespass against laws of nature that must inevitably lead to physiological discord—disease. Break the law if you can get away with it; otherwise don't break the law is the advice of science, viz., the prophylactic kit.

Man's failure to heed the laws of life is responsible for all the confusion and preventable misery suffered by him in the physical order. This confusion and misery is everywhere apparent.

The more materialistic the nation the more vigorously it treads the paths of luxury, and the more violently it departs from normal.

Great is the price paid for its caprices in painful infirmity and untimely death.

By a curious mockery of modern civilisation, the scientist and the teacher are found among the chief victims of this confusion, as we shall see.

§ 67—HUTCHINSON'S TEASPOON

Ignoring the extent to which patent medicines, headache powders, nerve tonics, constipation cures, "blood-builders," and the thousand and one self-administered doses are consumed by the ton, and denying outright that these physical infirmities owe their existence to modern "food refinement," many popular authorities persist in preaching the almost supernatural virtues of white bread.

In a widely circulated article on this subject, published in the *American Magazine,* under the caption "The Color Line in Foods," Dr. Woods Hutchinson said:

"The whitest possible of white bread was overwhelmingly

proved to be not only more appetising but weight for weight and price for price, more nutritious and more wholesome than any black, brown, or brindled staff of life.

"It is quite true that patent processed flour does not retain the yellowish and nutritious germ of the wheat berry and that this germ contains small amounts of 'fat' and 'phosphorus' which are not present in the remainder of the wheat and grain. But when the trouble was taken to weigh and measure the exact amount of this 'fat' and this 'phosphorus' it was found to be exceedingly small, and a single teaspoonful of egg and a mouthful of meat or fish or a teaspoonful of milk would more than make good the amount lost in an entire pound loaf of bread."

The error of Hutchinson's gospel is a matter of arithmetic.

A pound loaf of whole wheat bread contains approximately eight ounces of water and eight ounces of whole wheat meal. In the whole wheat meal the total quantity, not of "fat" and "phosphorus," but of fat, phosphorus, potassium, magnesium, manganese, calcium, silicon, sulphur, sodium, iodine, iron, and other bodies of unknown nature, approximates 2 per cent. of the entire grain.

The eight ounces of whole wheat meal in a one-pound loaf weigh 5,500 grains. Of this amount 2 per cent. or seventy grains consist of the mineral substances described.

Hutchinson asserts, "These substances are present in a teaspoonful of egg, a mouthful of meat or fish, or a teaspoonful of milk."

The eight ounces of patent flour in one-pound loaf of white bread weigh 3,500 grains. Of this quantity much less than one-half of 1 per cent., or, to be exact, eighteen grains, consists of the mineral substances described.

The difference between seventy grains, found in the whole wheat bread, and eighteen grains, found in the white bread, is fifty-two grains. These fifty-two grains, according to Hutchinson's declaration, are found in a teaspoonful of egg or milk, "which, therefore, more than offsets the loss sustained in white bread."

In milling the grain at least four of the mineral substances are entirely lost and many of the others reduced to a mere trace.

Let us see how these substances are restored by a spoonful of

egg. Eight ounces of eggs weigh 3,500 grains. Of this amount but sixteen grains consist of the mineral elements described.

To offset the deficiency of fifty-two grains a quantity of eggs yielding fifty-two grains must be consumed.

Eight ounces of eggs yield sixteen grains. One ounce of eggs yield two grains. To supply the missing fifty-two grains, twenty-six ounces of eggs, or approximately two dozen, must be consumed.

There remains a vast difference between a spoonful of egg and two dozen eggs.

Let us see now what would be required of a teaspoonful of milk in order that it might perform the miracle which Hutchinson asserts it does perform.

One pint of milk weighs 3,500 grains, approximately, and as seven-tenths of one per cent. of milk consists of the mineral substances described there are found in an entire pint but 24 grains of the missing 52 grains.

Thus, in order to offset the 52 missing grains, considerably more than two pints of milk must be consumed, just about three hundred times more than the resourceful teaspoonful of Hutchinson.

As for a mouthful of meat little need be said. The Madeira-Mamore poison squad had plenty of white bread, but no meat. The *Kronprinz Wilhelm* poison squad had plenty of white bread and all the meat its members could consume. The results in both cases were identical. Neither the absence of the meat nor its presence in any manner diminished or increased the nutritional value of the white bread consumed.

Had that bread been black, brown, or brindle it would have needed no such addition as "a single teaspoonful of egg, a mouthful of meat or fish, or a teaspoonful of milk."

This is a sample of the confusion of "learned" men. We shall now examine another.

§ 68—STRANGE CONCLUSIONS OF LUSK

The extraordinary manner in which purely speculative theorising concerning carbohydrates, proteins, fats and calories clashes

with actual fact was demonstrated at the anniversary meeting of the New York Academy of Medicine, November 20, 1913, when Graham Lusk made the statements that follow:

"It is necessary that the body have a constant replenishment of its protein store. There is no doubt of the superior value of meat, fish, egg and milk proteins to that of bread, beans and Indian corn.

"The proteins of rice and potatoes hold an intermediate position between the two classes of proteins above mentioned. Such facts make it possible to classify proteins according to their physiological value and they may be sold, therefore, as milk in three classes—A, B, and C. In a fourth grade, D, might belong gelatine and some other proteins which cannot replace the body protein which is continually wearing away.

"Experiments with wheat protein show that gliadin, which represents nearly one-half of the protein of wheat, is of inferior food value. It requires more protein in the form of bread to protect from protein loss than it does when meat or milk is ingested. The same is true of other proteins derived from grains."

In making these extraordinary statements before a group of learned scientists, Lusk entirely ignored the fact that meat protein, which he referred to in such extravagant terms, when deprived of its mineral salts, destroys life.

It is evident, therefore, that he did not establish his value of meat protein upon processed meat which we have seen, after having been immersed in distilled water and then fed to dogs, kills the animals.

Why, therefore, should he estimate the value of wheat proteins or the protein of any other grain upon the demineralised white bread protein or the demineralised Indian corn protein which he used as a base for his comparisons?

We have seen how, in the absence of the mineral salts, colloids and vitamines, natural to all foods, no kind of protein is of any value to any living animal.

We have not only seen that such protein possesses no value but is actually harmful. Reversing the order of Lusk's experiment it can be established that meat proteins from processed or exhausted meat are worthless compared with wheat proteins or

corn proteins containing all of the mineral salts and colloids of the unbolted grain.

At the same meeting Lusk also said, "The Eskimo consumes large quantities of meat, even as much as nine pounds a day, and yet health and strength are not wanting among these meat-eaters, and they are not the victims of uric acid diseases."

Contradicting this declaration of Lusk, the *Journal of the American Medical Association,* March 28th, 1913, said:

"We have previously noted the poor condition of health and sanitation obtaining among the natives of Alaska. In 1900 the census figures placed the native population of Alaska at 29,536, while in 1910 it had fallen to 25,331, a decrease in ten years of 14.5 per cent.

"Surgeon M. H. Foster of the public health service reported, August 11th, 1911, that at Sitka fairly reliable statistics placed the annual birth rate for a period of five years and seven months at 72.3 per thousand, and the annual death rate for the same period at 85.4 per thousand, an actual decrease in population of thirteen per thousand.

"On request of the Secretary of the Interior, Past-Assistant Surgeon Emil Krulish of the federal public health service was detailed to investigate the health and sanitation of the Alaskans under the commissioner of education. His report, under date of January 22nd, 1913, after a study of nine months, was filed with the Secretary of the Interior, January 25th, 1913.

"The report corroborates all the findings of Surgeon Foster. The most serious menace is tuberculosis, which, if not eradicated in the near future, will exterminate the native population of Alaska in the course of sixty or seventy years. This disease is present in all forms, especially in the pulmonary, osseous, and glandular types."

It is not surprising that the flock should be bewildered when the shepherd brings to the sheep-fold such an amazing assortment of fodder.

§ 69—DISEASE GERMS BAD WHERE THEY DO NOT BELONG

Charles Clyde Sutter, referring to the natural defence of the body against disease, says:

"We are continually in the presence of disease germs; almost daily we are exposed to contagious or infectious diseases, yet the body in health is able to protect itself and ward off the casual agents of disease. Any disturbance of perfect equilibrium in the functions of the body may be described as disease.

"The severity of the disease is determined by the intensity of the cause and by the state of the organism and its power of defence. The first general biological law or general attribute of living matter is that of self-preservation. The first biological acts of living protoplasm are therefore nutritional. For perfect health there must be complete appropriation, assimilation, and elimination.

"It is impossible to prevent the entrance of bacteria into the digestive tract with our food. Against this invasion the normal human individual is protected by the secretions of the stomach. The body is protected against the poisonous substances formed in the intestinal tract by the internal secretions, the influence of the lining membrane of the intestines, the liver, which alone destroys two-thirds of the poison, and by the various glands throughout the body which have the power of destroying toxic substances, and also by the organs which aid in their elimination.

"It will thus be seen, in accordance with natural law, that the organism is supplied with powers of nutrition which induce resistance, which enable it to protect itself by the destruction, by the counteraction, and by the elimination of deleterious agents, and thus, by adaptation, provide for the re-establishment of the disturbed equilibrium."

Notwithstanding the certitude of these frequently demonstrated truths the school teachers of the United States, who are also the victims of confusion in high places, make no attempt to influence the young to a proper understanding of the laws of nutrition.

Most of them are familiar with the erroneous but popular doctrines of Hutchinson and Lusk, but few, if any of them,

know that refined foods of high caloric value, cause a disturbance of the functions of assimilation and elimination.

They do not know that calcium salts, so wantonly removed from most natural foods, act upon the blood and blood vessels by tightening the unduly permeable vascular wall, thus promoting coagulation and stopping exudation.

They do not know, as summed up by Kayser in his review of the importance of calcium salts for the therapy of internal affections, that these salts influence the excitability of the nervous system by depressing the latter, especially the vegetative and autonomous, and are therefore indicated in internal medicine especially for tetany, epilepsy, hay fever, and asthma, in all of which they are used with success.

They do not know that through there ability to increase the phagocytic power of the blood, calcium salts appear to come into question for the therapy of infectious diseases, like pneumonia and tuberculosis, and that they also prevent oxalic acid poisoning.

Not knowing the importance of calcium in the diet, they can have no suspicion of the importance of phosphorus, potassium, manganese, iron, or any of the other mineral salts, colloids, and vitamines so indispensable to the normal physical and mental developments of their pupils.

In consequence of their ignorance of these fundamental truths they are unable, while learnedly discussing many of the ornamental isms and ologies of the class room, to direct the growing child in matters that have a greater bearing upon its future life than all botany, geology, geometry, geography, and astronomy combined.

The missing link in our modern system of education is to be found in the darkness which thus separates teacher from child.

§ 70—AILING INSTRUCTORS IN "ISMS" AND "OLOGIES"

According to records compiled by a committee, headed by Dr. Oswald Schlockow at the behest of the Brooklyn Teachers' Association, and made public November 14th, 1915, 20 per cent.

of the teachers during the school year of 1913-1914 were absent from illness.

All the data in the report were obtained from application blanks submitted by teachers to the board of superintendents for the refund of salaries deducted for absence caused by illness.

Illness usually affects the pocket book as well as the health of its victims, a fragment of human wisdom which the school teachers have obviously acquired. "That 20 per cent. of absences from duty is far too low is proved," says the report, "by the fact that refund blanks are not generally submitted for brief periods of absence. And, moreover, it must be assumed," continued the report, "that many teachers, who, under normal conditions would and should have remained at home, because of physical disability to teach, forced themselves to report for duty which they could not properly perform."

In other words, the pocketbook compelled these sick teachers to subordinate the hazards of doing those things which their physical condition made next to impossible to the stern necessity of earning money.

The total number of applications for excuse of absence for all causes in the year 1913-1914 among this one group of teachers was 4,148. The total time lost by their illness was 68,442 days. The four prevalent ailments responsible for this loss were diseases of the respiratory organs, infectious diseases, diseases of the nervous system, and diseases of the digestive system.

The throat and lung troubles it was found constituted 35 per cent. of the diseases, acute contagious diseases 16 per cent., nervous diseases 15 per cent., and digestive disorders 11 per cent.

These four diseases follow loss of resistance and immunity.

"The fact disclosed by our investigation," declared the committee headed by Dr. Oswald Schlockow, "that over one-fifth of the entire teaching corps of the city was absent because of illness during one school year indicates the existence of an administrative problem of great moment.

"The teachers' health ultimately determines the efficiency of the entire educational system of the community.

"The heavy morbidity rate ascribable to respiratory diseases," it declared, "deserves an investigation by the school authorities into the system of ventilation."

Here, again, is a striking symptom of the confusion of the times. "It is evident that we must know what kind of air our teachers and their pupils breathe," assert the investigators, but there they stop.

The crew of the *Kronprinz Wilhelm* lived in the open air of the open sea. The convict poison squad of Mississippi breathed the purest air under the most hygienic and sanitary conditions which the state could provide. The railroad laborers of the Madeira-Mamore poison squad breathed an air uncontaminated by the fumes of the modern industrial settlement. Pure air and debased foods are not compatible.

The school children of the country will never learn this fact until their teachers learn it.

§ 71—THIN-HAIRED WOMEN AND BALD-HEADED MEN

As school teachers take their classes on inspection tours through the patent flour mills of Brooklyn the commerical chemists who pilot them from grinder to sifter and from sifter to bolter always volunteer the information that white patent flour is incomparably superior to whole wheat meal.

"White flour is far more nutritious than any mulatto-coloured product ever milled," they say. "Professor Harry Snyder says so."

The teachers, impressed by the immensity of their surroundings, and the really extraordinary experience of watching a battery of mills in operation in a large plant, go back to their classes perfectly satisfied that white bread will do after all.

It never occurs to them that should Professor Harry Snyder speak out in meeting the money invested in so-called patent flour mills would have little use for him.

Any school teacher who wants the truth can have it for herself without reference to Professor Harry Snyder. All she needs are three pieces of grits gauze known as No. 30, No. 50 and No. 60, three pieces of silk bolting cloth, known as No. 9, No. 10 and No. 13, a small Fairbank scale with weights measurable by the one-thirty-second of an ounce for rough estimates and one grain weights for finer estimates, a magnifying glass that

will enlarge ten diameters or a small microscope that will enlarge 100 diameters.

With this outfit if the school teacher will take eight ounces of Whole Wheat Meal and put them through the simple operation suggested here some disclosures will be made that will prove little short of startling.

I have capitalised Whole Wheat Meal because every city in the United States gives shelter to hundreds of packages of so-called entire wheat flour which, not being entire wheat at all, will not serve our purposes.

Carefully sift the eight ounces of whole wheat meal through the No. 30 grits gauze. All the meal except approximately one 16-32 of an ounce passes through the gauze.

With the magnifying glass it will be seen that the one 16-32 of an ounce left on the No. 30 grits gauze consists of large particles of bran and germ with the "brush flour" that adheres to the bran.

The bran is found to consist of rough, canvas-like, brownish particles, with a very remarkable suggestion of woof and warp. The germ, difficult to distinguish from bran with the naked eye, will be found to consist of rich, oily, cream-coloured particles.

A chemical analysis of this bran and germ, which take up large quantities of water and hold it in the intestines for lubricating purposes, shows they contain the mineral salts, colloids, and vitamines. Both bran and germ are rich in silicon, sulphur, nitrogen, iron, iodine, potassium, manganese, phosphorus, nucleo proteins, or phosphorised albumens, lecithins, or phosphorised fats, and the simple phytin compounds and phosphates without which, as proved in the St. Petersburg experiment, no animal can be properly nourished.

The woman who values the thin and lustreless hair that remains to her, and the bald-headed man who wishes he had some hair to value, even thin and lustreless, will look dejectedly upon the discarded silicon, and the anemic creature who seeks in vain for solace in beef-iron-and-wine will pray for the miller who throws all this elemental food to the hogs.

The teacher is now ready for operation No. 2. By sifting the balance of the wheat through grits gauze No. 50 it will be found that one and 5-32 of an ounce will remain on the gauze

Under the magnifying glass these particles, less coarse than those that were sifted out first, will be identified as bran, germ, and middlings.

No handsomer breakfast food ever appeared on the market, and yet such breakfast food is know only to swine.

The calcium, so necessary to Mother Nature in her calcification of tuberculous areas, will be disclosed under chemical analysis in these rejected keystones of the human arch.

The school teacher's pupils will say, "Do we not eat this beautiful stuff held by grits gauze No. 50?" and the school teacher will say, "No, dear children, this is cattle food."

§ 72—A PRETTY TEST

The school teacher, carefully sifting the balance of the wheat through grits gauze No. 60, finds that one and 29-32 of an ounce remain on top of the gauze. This rejected material consists of fine particles of germ, branny specks and middlings with their precious salts and colloids.

A chemical analysis of the contents of grits gauze No. 30, No. 50, and No. 60, shows that about two-thirds of the mineral salts of the original whole wheat have been removed and thrown away.

She will now take No. 9 silk bolting cloth and pass the balance of the wheat through it, whereupon she will find that two and 18-32 ounces remain on the silk. Again the magnifying glass is applied. The rich, cream-coloured particles consist of fine middlings, fine germ, and a few branny specks.

In this intimate mixture the bran is brown, the germ yellow, and the middling white. The combination is very beautiful but it is not sufficiently anemic for human food.

The chemical test is again applied. It is discovered that on silk bolting cloth No. 9 and grits gauze No. 30, No. 50 and No. 60, three-fourths or 75 per cent. of the total original mineral content of the whole wheat has been deposited. This mineral deposit represents the loss all white flour sustains.

The balance of the wheat is put through No. 10. Only 17-32

of an ounce remain on the cloth. The lens reveals this to be very fine middlings, sometimes known as farina, sometimes known as cream of wheat. It will not support life.

Now take the balance of the whole wheat meal and sift it through silk bolting cloth No. 13. One and ten thirty-seconds of an ounce remain behind. This is fine flour, the *summum bonum* of modern milling.

More refined, white, patent flour can be recovered from the middlings scattered through the other separations, so that out of the eight ounces of whole wheat about five ounces of flour, minus the minerals of the wheat, can eventually be recovered.

This flour is subdivided by the millers into patent, straight, and low-grade. When patent flour was selling for $7 a barrel of 196 pounds, straight flour sold for $5 a barrel of the same weight, and low-grade flour for $4.25 a barrel.

The high-grade flour, consumed by the baker, costs just half as much as the low-grade flour going to the dear people who don't know a thing about it.

The phrase "high grade" is not employed in the significance of nutritional value. The higher grade the flour the more it has been robbed of the elements indispensable to health.

As our school teacher becomes skilful enough in her use of the grits gauze and silk bolting cloth it will be easy for her to separate the low grade, the inferior flour and the siftings and tailings from the so-called patent flours.

After having sifted the patent flour through the silk bolting cloth, the school teacher will obtain a few slides of window glass, six or eight inches long by two inches wide. On one of these slides she will arrange a few little hills of the different siftings of the patent flour upon which she is experimenting.

Placing these little hills side by side she will carefully slick them off with another piece of glass until with one steady downward pressing pull she has levelled all the little hills and given them a smooth surface.

She will then immerse the glass slide with its layers of patent flour in a pan of cold water. This operation will bring out the bloom of the so-called high-grade flour and the grey of its low-grade neighbours.

The lines of difference between each of the separations will

be as plainly marked as a hedged fence. The school children will not be satisfied to stop when they witness these exhibitions. They will want to jump the fence, and explore the field beyond.

§ 73—EXPERIMENT WITH CHICKENS FOR BOYS AND GIRLS

When school teachers manifest an interest in the definition of the word "food" the school children will begin to learn something about themselves not now taught through any text books.

They will learn that the school girls of to-day are destined to be the mothers of the race ten or twenty years hence and they will understand why the school room is the place to study foods in their relationship to health and disease.

In the basement or on the roof there will be ten cages divided into two groups of five each.

There will be four chickens in each cage of the first group. The cages of the second group will be empty. The school children will feed the chickens.

The chickens in cage No. 1 will be fed whole corn, whole oats, natural brown rice, whole wheat, unpearled barley, grass or greens of any kind, and water. The children will note that on this diet the chickens in cage No. 1 will be proud and spirited. Their feathers will be brilliant, their flesh firm, and their bodies well developed.

The same children will feed the chickens in cage No. 2 with simple mixtures of whole grains and denatured grains, the remainder of the diet being the same as that of cage No. 1. They will note that at the end of a period of six months there will be a marked superiority in the appearance of the chickens in cage No. 1.

The same children will feed the chickens in cage No. 3 with pearled barley, polished rice, processed oats, degerminated corn meal, and dough balls made of white flour and water with the same quantity of greens fed to the chickens in cages No. 1 and No. 2.

In a few months the marked physical degeneracy of the health of these chickens will teach the children its own lesson.

The same children will feed the chickens in cage No. 4 with beet pulp, from which some of the mineral salts have been extracted by leaching in distilled water. In addition to this they will feed the chickens with soda crackers, white biscuits, gingerbread, gingersnaps, white bread, pie crust, and candy, plus water, with the usual quantity of gravel and greens.

The conditions of the chickens in a few months will be eloquently suggestive.

The same children will feed the chickens in cage No. 5 with white bread, white biscuits, white crackers and cakes, cream of wheat, farina, macaroni, corn flakes, caramels, soda water, and other fancy drinks.

As the feathers of these chickens begin to droop and the chickens begin to huddle in the corners of their cages, seeking for the darkness, miserable even unto death, the lesson of the relationship of food to animal life will be taught.

At this stage of the experiment the healthy chickens in cage No. 1 will be transferred to cage No. 6 and there they will be fed on the diet of cage No. 5 until they, too, begin to show the same symptoms of dissolution and disease.

The chickens of cages No. 2, No. 3, No. 4, and No. 5 will then be transferred to cages No. 7, No. 8, No. 9, and No. 10, where they will be fed on the natural, undebased, unimpoverished, undenatured diet of cage No. 1.

The school children will see the sick chickens recover rapidly, and they will go through life with a lesson thoroughly learned. When they assume the responsibility of home life for themselves they will know that to abandon the laws of nature in the pursuit of some capricious food ornament will be at the expense of the health, happiness, and welfare of those dependent upon them.

§ 74—WHAT THE CHILDREN WILL LEARN

Having become familiar with the chicken-feeding experiments, the children will learn that it is possible to alter the resistance of animals at will, and to overcome the effects of one diet by combining it with another.

They will learn that the resistance of animals as determined by Hunt, even to certain poisons, differs greatly according to the character of their diet.

They will learn that Bulletin 69, Hygienic Laboratory, United States Treasury Department, declares "that in extreme cases mice after having been fed on certain diets, may recover from forty times the dose of acetonitrile fatal to mice fed on other diets."

They will learn that a diet of oats or oat meal usually leads to a marked resistance, and that the administration of certain iodine compounds with such a diet further increases an abnormal resistance.

They will learn that the experiments reported by the Government show that as far as resistance to acetonitrile is concerned, iodine exerts its action through the thyroid gland, and the resistance caused by an oat diet is in part an effect exerted upon the thyroid.

The result achieved with iodine in the Rotunda Hospital, Dublin; the thyroid researches of Victor Hoarsely and the discovery of thyroidine by Bauman, have led more than one pathologist to the conviction that iodine is a potent factor in the neutralisation of the toxic substances formed in the human body.

They will learn something of the most amazing developments of the war in the 1918 report from the British government laboratories at Cambridge, Glasgow and London, and various factories and hospitals in which government war bread experiments were conducted.

They may ask the question in the presence of that report, "Is it not strange that after a nation-wide campaign to discourage the use of whole grain bread in the United States, a campaign that received the backing of the Food Administration itself, there should come from the British government a declaration that it finds bread composed of whole wheat flour mixed with 20 per cent. of other cereals not only suited to all ages and digestion, but also yielding a higher percentage of energy?"

They will learn that the British loaves used in the experiment were baked from flour milled under the personal supervision of A. E. Humphreys, president of the National Association of British and Irish Millers.

They will learn that no precaution was omitted to make the experiments complete, and that every result was worked out in a series of tables.

They will learn that at one factory in Yorkshire the tests were applied to a group of men, women and children, whose sole bread supply for two months was whole wheat bread.

They will learn that although under medical supervision throughout their experience, in no case did the whole wheat bread cause digestive troubles, but that the health of the subjects improved during its use.

They will learn that the people of New York City, now consuming more than 100,000 loaves of 100 per cent. whole wheat bread every week, could have told the British government this and much more several years ago.

"When the whole wheat bread was tried on various sufferers from tuberculosis," declares the British report, "most of them gained weight. The main fact established is that the human body can make better use of the parts of the wheat grain which have hitherto been discarded, than pigs and poultry to which these rich and nutritive by-products of milling have been given in the past. The country has gained enormously in food and energy from the compulsory inclusion in the loaf of these rejected by-products."

Well may the children ask, "What did the millers, the profiteers and the Food Administration officials say when this British report was made public?"

In the meantime they will learn, from such hints as these, that man is guilty of sin, when he knowingly and deliberately removes from his food supply, in order to make it commercially profitable, those profoundly active and indispensable substances that God has compounded not for the benefit of the food manufacturer, but for the benefit of little children, and the fathers and mothers who lovingly, anxiously, and in pain watch over them.

They will learn that all through nature are exhibited subtle hints that the fixed laws under which all unjuggled food comes to man's hands were intended with the co-operation of man's intelligence to serve his needs.

They will learn that nature demands of man that he shall accept her dispensations not as accidents, but as exquisitely rhythmical processes, as profound in their operation as they are benevolent in their functions.

SIX: HOW "BUSINESS" MUZZLES TRUTH

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§ 75—"UNSOUND FLOUR," EVEN THOUGH WHITE

Before dismissing white flour, it is necessary to refer to two other forms of flour against which the public needs protection. One is called "unsound flour," the other "bleached flour."

Prior to August 19th, 1913, the authorities had never bothered about the question of unsound flour in the city of New York, although the New York Produce Exchange for years had maintained a department, the chief duty of which was to reject such flour, so that members of the exchange would be protected against the financial loss involved in purchasing an inferior or inedible flour.

The government had never made a seizure of such flour notwithstanding the enormous traffic in spoiled flour carried on.

Flour men suffered no worries concerning any possible official interference with the final disposition of the rejected product. It was easier to work off decomposed flour by mixing ten parts of the rotten product with ninety parts of sound flour, thereby avoiding waste through the medium of the public's stomach. This unsound flour was always sold at a ridiculous price, but the public always paid the regular market price for the finished breadstuff from which it was made.

Such was the situation August 19th, 1913, on which day, in order to bring the issue to a crisis, I arranged with Dr. William H. Allen, director of the New York Bureau of Municipal Research, to have some of his men make an investigation with me of the grain piers of Jersey City.

Accordingly, Dr. W. H. Deaderick and J. H. Kirshman, of the New York Bureau of Municipal Research, accompanied me on an inspection of the Lehigh Valley flour and grain piers. There we discovered 58,800 pounds of unsound, musty, and inedible flour packed in the regulation 196-pound cotton bags.

These bags are porous. All flour is shipped in them. Rats run

over them. They are subject to many unspeakable forms of contamination in the freight yards. But that is still another matter relating not to nutrition but to sanitation.

The regulations of the New York Produce Exchange require flour to be marked "Sound" or "Unsound." None of this flour bore any mark indicating its true nature and no satisfactory explanation could be made by Flour Inspector W. J. Taylor, in charge of Piers I, G, and E, Lehigh Valley Railroad, Jersey City.

I notified the New York station of the bureau of chemistry, Department of Agriculture, of our findings. Federal Inspectors Lind and Ford were despatched to the scene. The government men were denied access to the flour by the railroad officials.

For a period of twenty-four hours they believed they could do nothing with the stuff which, in the meantime, had been rejected as "unsound" by Messrs. Hewer & Siney, of the New York Produce Exchange, and sold at a fraction more than a cent a pound to a blending plant on Staten Island.

The government's inspectors, in communication with Washington, were instructed by wire to make another effort to examine the flour. They returned to the pier the following day but, in the meantime, somebody had performed a mysterious ceremony over the decomposed stuff.

During the night the contents of the 196-pound bags were transferred to 140-pound bags. The manipulation was intended to rescue the rotten flour from the jurisdiction of the government officials.

It has been held in the trade and in more than one federal district court that the government's jurisdiction over any product, however rotten, comes to an end once that product has been removed from the original package in which it had been shipped into interstate commerce.

Dr. Carl Alsberg, chief of the Bureau of Chemistry, was immediately notified of the complexity of the situation, and, regardless of the legal aspect of the case, his efforts finally resulted in a seizure of the rotten flour on a libel issued by United States District Attorney Warren Davis, Trenton, N. J. The attachment was made by United States Deputy Marshal Beekman, Jersey City.

Prior to this seizure I had made numerous vain attempts to

obtain action through the New York City Health Department, but the Health Department refused to concern itself with the unsoundness of the city's bread supply.

It is not generally known or even suspected that unsound flour is exceedingly common. They tell us whole wheat flour spoils. They do not refer to spoiled white flour.

§ 76—"BLEACHED FLOUR"

Most large cities and nearly all the small towns of the United States are deluged with bleached flours. Millers of the middle west are dumping low grade bleached products into bakeshops in carload lots. Scarcely a day passes in which the chief inspector of the New York Produce Exchange is not called upon to examine bleached flour. Even the housewife can detect this fraud if she so desires.

The baker who uses bleached flour knows what he is buying at a cheap price for the reason that the barrel in which it reaches him is labelled according to its contents, although he is not required by law to label his bread and cake in the same way.

The federal pure food label on bulk packages is intended only as an index of wholesale values for the benefit of the manufacturer or merchant. It does not follow the manipulated foodstuff into the hands of the consumer. Hence the consumer knows nothing of the vast system of fraud which ends when the bulk package is safely delivered to the cellar or sub-cellar of the food factory, or deposited in a public warehouse subject to the food factory's orders.

The test for bleached flour is a simple one and a rather pretty experiment. Take a handful of the suspected flour. Pat it into the form of a little mound or pyramid, placed on a marble slab or wooden table. With the thumb depress the top of the mound, thus forming a cup or well about the size of a thimble. Into this well pour a teaspoonful of a mixture purchasable at any wholesale drug store under the name of the Gries Haswar Reagent. This reagent is a mixture of equal parts of sulpha-

nilic acid and alpha-naphthylamic. Both these substances can be purchased in any city drug store.

Let the reagent stand in the well in the mound of flour for from ten to twenty minutes. If the flour has been bleached the reagent will be coloured pink. If the flour has not been bleached there will be no discolouration.

Under the existing sanitary codes of most American cities there is a provision which enables the Health Department of most communities to proceed against the thousands of carloads of bleached flour which the middle western millers are now unloading upon the public.

The government, which has failed to prevent the bleaching of flour for interstate commerce, needs the aid of local health departments to help it in its efforts to stamp out this base and indefensible practice.

Flour is bleached to conceal inferiority by making it appear of better quality than it is. Most sanitary codes provide against the staining, colouring, coating or bleaching of any food product for the purpose of concealing inferiority. Under such provisions it becomes an easy matter for the corporation counsel of any American city to bring action against bleached flour.

Not satisfied with robbing the wheat of its most indispensable mineral elements, millers have still further debauched their industry by resorting to electrolytical chemistry in their efforts to fool the people.

That the flour and grain markets of the world are notoriously corrupt is not disputed by those on the inside of the situation. The extent to which this corruption is destined to be tolerated depends entirely upon the capacity of the people to understand its heinous nature and apply the remedy that lies at hand.

I do not insinuate that bleached flour is in itself any more responsible for any of the diseases of malnutrition than any other form of denatured flour, nor do I intimate that it constitutes more than a symptom of the confusion and chaos in which the United States permits its food standards to become legally entangled.

Bleached flour may have nothing to do with infant mortality. It does, however, have much to do with sham, fraud, make-believe, and as such it must be treated.

§ 77—THE "MIXED FLOUR" EVIL

It was known in the trade long before the outbreak of the Spanish War that millions of pounds of adulterated white flour were annually sold to bakers. It was the custom of the trade to cheapen the so-called patent flour manufactured by the millers of wheat by adding varying percentages of corn starch or rice starch or potato starch, all of which in bulk were purchasable before the war at a price at least one-third less than the price of wheat flour.

During the years from 1910 to 1915, for instance, wheat at the large centres ranged in price from 77¾ cents to $1.31 per bushel, the average price being about $1 per bushel.

During the same period the price of corn in the same markets ranged from 45 cents to 86 cents per bushel, the average price being 65 cents per bushel.

Congress, seeking new revenues during the Spanish War and knowing the trickery of the wholesale bakery supply houses, included in the Spanish War revenue act of 1898 a provision fixing a tax of 4 cents a barrel on "mixed flour," together with an occupation tax of $12 per annum and providing that the manufacture and sale of mixed flour shall be conducted under the control of the Department of Internal Revenue.

The Spanish War revenue measure did not concern itself about fraud or public health. It was a money-raising proposition. It was, however, an eloquent index of a situation, the very existence of which had never been suspected by the people.

Whether it was known or not, nearly all bakers before the Hoover regulations were issued requiring them to use wheat flour substitutes at three times their value, were producing five- and ten-cent loaves with the assistance of corn starch, rice starch, potato starch, or other water absorbing ingredients.

The manufacturers of corn starch or corn flours are themselves on record with the following statement:

"The philosophy of the present mixed flour law is that the mixing of wheat with other cereals or the products thereof is a vicious practice, but that upon the payment of certain taxes

the miller who is sufficiently conscienceless to do so can make almost any sort of mixture.

"As a matter of detail it should be borne in mind that the wholesomeness of mixed flour is not at present protected by the law of 1898, but rather the more recent food and drugs act (1906). Consequently the removal of the taxing provision could by no stretch of the imagination have any effect whatever upon the important point of wholesomeness."

The manufacturers of corn starch declare that "technical research in this country and practical experience abroad have shown that the protein of wheat is sufficiently strong, easily to carry through the process of bread-making 20 per cent. added starch, be the source of that starch rice, potato or corn."

Let us examine the philosophy of the corn starch manufacturer who describes his product as "a yeast food flour." I have a signed statement in my possession, dated March 10, 1915, addressed to the bakers of the country by one of these corn products manufacturers. Because it tells just why corn starch is used and throws inside light upon the subject I quote it in full as follows:

"If there ever was a time when in justice to your business you should use 'special yeast food flour' it is right now. When you can buy 'special yeast food flour' at about the same price as wheat flour or probably a little less and when you consider that 'special yeast food flour' will give you a net profit of at least $6 per barrel over the profit you get on your wheat flour, you certainly cannot afford to manufacture bread without 'special yeast food flour.'

"Two hundred pounds 'special yeast food flour' with 400 pounds water makes 600 pounds material.

"Two hundred pounds wheat flour with 120 pounds water makes 320 pounds material.

"Other ingredients (lard, salt, etc.) are not figured in this computation, being the same in each case.

"This shows a net gain of 280 pounds material for every barrel 'special yeast food flour' used.

"Even figuring that you only get 200 pounds baked bread extra from every barrel of 'special yeast food flour' used in your

shop and only figuring the cost of bread at 3 cents per pound you can readily see that you are making a profit of $6.00.

"As a matter of fact a barrel of 'special yeast food flour' will give you more than 200 pounds of baked bread extra and no doubt your cost of bread now is more than 3 cents per pound.

"It is therefore up to you to decide how much 'special yeast food flour' you can use. If you use a barrel a day or 200 barrels a month, as other large bakers are using, you still make at least $6.00 on each barrel. This means an extra profit of from $180 to $1,200 a month through the use of 'special yeast food flour' alone.

"Everything that we claim can be demonstrated to your entire satisfaction in your own bakery and the results you will get will prove that what we have written in this letter is true in every sense of the word.

"Ninety per cent. of the large bakers in this country and Canada are using 'special yeast food flour.'

"If 'special yeast food flour' is wrong then nine out of every ten bakers are wrong, which would hardly be possible.

"Is it not fair to assume that they are using it because they make good profit from it?

"May we, therefore, send you a shipment at once? Your early order will be appreciated. Yours very truly,

"....."

"Manager."

This letter is characteristic of many others now in my possession. It reveals the real purpose for which corn starch is utilised by bakers in the systematic and ever-increasing effort to lower the food value of the staff of life in order that constantly increasing profits may be obtained.

§ 78—THE DEVITALISED FIVE-CENT LOAF

The manner in which the staff of life can be manipulated at will for commercial purposes indicates the necessity of establishing an official definition of the word "bread," together with means of controlling its integrity.

In February and March, 1915, much interest was aroused concerning the use of "plaster of Paris" in the production of the bread made by one of the largest bakers in the United States.

Considerable light was shed upon the secret use of a mineral mixture in the making of bread in Boston, New York, and other American cities, when Referee Nussbaum, at the inquiry of New York State into an alleged conspiracy to increase the price of bread from five to six cents a loaf, on the ground that war prices made bread ingredients higher, probed into the secrets of wholesale bakers.

Prior to the taking of testimony in the bread case, at the office of Deputy Attorney-General Alfred L. Becker, 299 Broadway, New York City, Inspector James O. Jordan of the Boston Board of Health made a report to Mayor Curley, in which he asserted that bakeries in New York and Massachusetts were making bread which contained calcium sulphate, otherwise known as gypsum or plaster of Paris, materials used in making plaster casts.

When questioned concerning the truth of Inspector Jordan's report the vice-president of one of the largest baking concerns of the world, admitted at the state's hearing that such a product was in use, that it had been employed for three years prior to the date of the state's investigation, and that it had been patented.

He justified its use on the ground that it enabled the baker to leaven his dough before excessive fermentation took place.

"Excessive fermentation," he said, "is destructive of practically all food values in the ingredients used in modern baking." He argued, therefore, that the only bread which retains any food value is the bread that contains this patented powder, for the reason that prior to its discovery all bakers' bread was worthless because of the destruction of practically all of its food value.

We have examined the evidence that shows white bread is not a bone-builder.

We have examined the evidence that proves pigeons fed on white bread suffer a loss of the lime salts of their bones even to the extent of perforation of the skull.

We know that Voit established this fact as long ago as 1882.

According to the report of the Boston Board of Health on the

composition of this "plaster of Paris" powder the samples examined contained calcium sulphate, 24 parts; sodium chloride, 24.90 parts; ammonium chloride, 11.50 parts; starch, 30 parts.

The testimony taken before Referee Nussbaum placed on record the admission of one of the most prominent white bread bakers in the world that white bread is worthless bread, devoid of food value unless it contains a certain chemical compound manufactured under the direction and control of certain commercial corporations.

When the people are informed that the way to restore the food value of white bread is to add to it a compound of gypsum or plaster of Paris in amounts however small, all the indictments charged against the broken staff of life are unwittingly confirmed.

The highest of high prices paid for denatured bread means nothing to the well fed or to those in comfortable circumstances, but to the average American family, whose daily diet consists largely of bread, it means decay.

The poor and the rich together are consuming an inadequate substitute for wheat in the form of white flour food, but the poor, who need all the honest nourishment they can get, consume by far the greatest quantity of this foodless form of food.

In New York City the common people know that the European war early in 1915 was merely an excuse for advancing the price of bread to six cents. It was because they cried out against this advance that the attorney general of New York State interfered.

They know that it was due to his interference that the price was not only returned to five cents, but that one year later, February, 1916, when the raw materials from which bread is made were bringing even higher prices than when the six cent rate was arbitrarily fixed, one large concern in New York City sold the same bread made by the same people at four cents a loaf.

By its clamour the public had affected the price of bread while remaining in ignorance concerning its devitalised character. Growing children who eat bread three or four times a day are not concerned in an advance of one cent a loaf or in a reduction of one cent a loaf.

The bread inquiry of the attorney general of New York State, through the extraordinary admissions which it provoked on the

part of the bakers themselves, shocked and for a time confounded the entire white flour industry of the United States.

§ 79—A PAID ADVERTISEMENT

Immediately following the disclosures made by Inspector Jordan and Referee Nussbaum, the following newspaper advertisement appeared under this caption: "About Four Years Ago the Blank Baking Company Engaged Three Trained Men and Instructed Them to Devote Their Time in Search for a Method of Making Better Bread." This Resulted in the Greatest Discovery Ever Made in the History of the Bread Business and is a Great Boon for the Benefit of Humanity.

"In view of the inaccurate, misleading and really absurd newspaper statements that have been made regarding the methods employed by our company we wish first to state a fact within the knowledge of every housewife, that yeast is a living organism and in order to live and multiply, and thereby leaven the dough, the yeast must have food.

"In the old process this food was the flour, sugar, and other constituents of the dough. The yeast consumed a certain portion of these materials and converted them into alcohol and other products, including a certain gas which raised the bread and made it light.

"Under the new discovery, however, minute amounts of certain salts are added which serve in place of a part of this food which, under the old method, the yeast consumes.

"In the old process a portion of the flour, particularly the glutenous part, was broken down by the yeast and thus valuable nutritive properties were lost.

"By the new process this does not take place, but, on the contrary, a greater percentage of the natural gluten of the wheat is retained in the baked loaf.

"In order that exact minute quantities might be properly introduced, first into the water and then into the dough, these salts were made up into a powder.

"Of this powder a very minute amount is added to the 1,500

pounds of material—flour, sugar, milk, vegetable oil, yeast, salt and water—which constitutes a standard size dough in our bakeries.

"The result is that there is left in the bread four one-hundredths of 1 per cent. of calcium salts which are the identical salts contained in all natural waters and practically all vegetable and animal products.

"On a percentage basis fresh milk contains more than four times as much natural calcium salts as if contained in the form of the artificial calcium salts put into Blank's bread.

"In other words, one glass of milk contains as much natural calcium salts as two loaves of Blank's bread contains of artificial calcium salts. Cheese contains about thirty times as much, peas contain about three times as much, greens twelve times as much, beans five times as much, chocolate three times as much, turnips twice as much."

The advertisement drew no contrast between the organic calcium compounds found in natural foods and the laboratory product introduced in the bread referred to. It confined its assertions to the claim that the calcium thus introduced made bread better, but it said nothing of the natural organic compounds of iron, phosphorus, potassium, magnesium, manganese, fluorine, etc., which the yeast powder did not restore to the white bread described as "a great boon for the benefit of humanity."

The advertisement went on:

"Medical men have shown that a normal adult drinks in twenty-four hours three and a half quarts of water. A twenty-four hour supply of many natural waters would contain as much calcium sulphate as is found in ten loaves of Blank's bread.

"The above citations are sufficient to show that the salts are present in such small amounts that no question can arise in any one's mind not antagonistic to the real facts that they are not used for any purpose of adulteration or deception.

"Some of the reasons for their use are as follows:

"In the leavening of bread the yeast, besides forming the gas, carbon dioxide, which makes the bread light, also forms alcohol and certain by-products which in the similar process of fermentation of grains to form whiskey we call 'fusel oil.'

"This fusel oil is a very poisonous and rather disagreeable

smelling oil. This action takes place whenever bread is raised by yeast whether in the household or in the bakery.

"The amount of fusel oil and certain other disagreeable acid products thus formed is very small, but has its effect upon the bread and certainly does not make the bread any more wholesome.

"In the new process the amount of these fusel oil products is diminished almost to the vanishing point. The result is a bread with better taste, odor, color, texture, and flavor, and a more wholesome bread because of the absence in this process of these small amounts of objectionable products."

These statements really mean that the many millions of loaves of bread baked by the Blank bakery prior to the discovery of its yeast food powder contained the very poisonous and rather disagreeable smelling fusel oil and certain other disagreeable acid products which develop in all bread in which the Blank yeast powder is not used.

§ 80—"THE LID IS OFF"

The advertisement of the Blank bakery, published apparently for the purpose of neutralising the published report of Inspector Jordan and the facts disclosed by Referee Nussbaum continued as follows:

"From the above citations regarding the natural occurrence of calcium sulphate in foods it would be evident to every one that calcium sulphate is perfectly harmless as it is present as a natural constituent of so many foods that are daily consumed by the people.

"In fact, we might go further than this, as the opinion among the best medical authorities is that the food supply of the people does not contain sufficient calcium salts which are so necessary in the formation of bones, teeth and other tissues, especially to growing children.

"Physiologists tell us that an adult man should have in his food one and a half grams of lime as lime salts per day. To obtain this amount from bread alone he would have to eat seven loaves of Blank's bread, while one quart of milk would furnish more than the required amount.

"It has become a common practice in the purification of water supply for the cities to add to the water small amounts of calcium hypochlorite. This practice is heartily indorsed by all public health and medical authorities. A percentage of added lime put in in this way is in all cases a larger amount than the added lime salts in Blank's bread.

"We know that Blank's bread as made to-day is the best bread in the world; better bread than you can make in your own kitchen, and better bread than you can buy except under the name Blank.

"Our company has done more for the baking trade in advancing modern ideas in baking and in the erection of modern plants than any concern in the trade.

"The lid is off, we have nothing to hide, never have had anything to hide and you may feel secure in the use of Blank's bread and know when you buy it you will use the best obtainable. No better or cheaper food exists. Feed it to your children in generous portions. It is good for them."

(Signed) "BLANK BAKING CO."

This advertisement did not inform the public that the standard bushel of sixty pounds of wheat produces fifty-nine pounds of whole wheat meal, one pound being lost in the form of moisture through evaporation in the grinding, and that the same bushel of wheat produces but forty-five pounds of white flour, showing a loss of fifteen pounds of the most vital elements of the wheat, including more than 75 per cent. of its total mineral content—a loss not made up in the baking of white bread by the use of any patented powder.

It did not inform the public that every barrel of white flour represents a loss of sixty-five pounds of the most precious elements of the wheat—elements which are thrown to the hogs and which are not restored to white bread by the addition of any patented powder.

§ 81—IMITATION GRAHAM

Following are the standard bakery ingredients of white bread and whole wheat bread at pre-war prices:

196	pounds white flour	$4.00
124	pounds water	.00
4¼	pounds salt	.05
2	pounds sugar	.11
2	pounds yeast	.10
8	pounds compound	.80
	Total	$5.06

This mixture represents a total cost of $5.06, which produces 180 loaves to retail at 10 cents each, or 360 loaves to retail at five cents each.

The ten-cent loaves when scaled off before baking weigh thirty ounces. During the baking process they lose three ounces by evaporation, coming out of the oven weighing approximately twenty-seven ounces.

The five-cent loaves when scaled off before baking weigh fifteen ounces. When they come out of the oven they weigh between thirteen and thirteen and one-half ounces.

The gross profit to the baker with flour at $4 a barrel is the difference between $18, the selling price of 180 loaves at ten cents a loaf, and $5.06, the actual cost, or $12.94.

One large baker, with whom I am familiar, paid in January, 1916, $5.50 a barrel for his white flour. At this price his gross profits on each barrel of flour was $11.44 on an investment of $6.56, including cost of sugar, salt, compound and yeast.

There are many miserable substitutes for honest whole wheat bread which masquerade under a whole wheat label. They are soft, soggy, brown, and, one would say, if it were not for their poor flavour, almost tasteless. Certainly such loaves of so-called whole wheat bread can never inspire adult or child to an appetite for more.

Such bread discourages bread reform. Nevertheless there is on the market, in addition to a few genuine whole wheat loaves, a near approach to whole wheat which is made according to the following formula:

257 pounds whole wheat,
154 pounds water,
14 pounds molasses,
5 pounds salt,
7 pounds compound,
5 pounds yeast.

This quantity of raw material produces 289 loaves, which retail at ten cents each. These loaves are scaled off to weigh 24½ ounces. Losing 2½ ounces in the oven by evaporation, they weigh a scant 22 ounces after baking.

The significant feature of these figures to the bread consumer lies in the fact that it costs $1 a barrel less to manufacture a whole wheat meal than it does to manufacture white patent flour, and yet the millers of whole wheat meal charge the baker $1 more for their products than they do for patent flour, making an arbitrary difference of $2 in favour of their own pocketbook.

In other words, they obtain $2 a barrel more for a product which costs $1 less.

When bakers take the stand and admit under oath that white bread is foolish bread, without food value, they render a service to the community, but when they say that the way to restore the food value of white bread is to load it up with plaster of Paris or gypsum, or any other form of patented powder, they deceive themselves, they deceive their bread, and they deceive those who eat it.

§ 82—PHYSICIANS SEEK IN VAIN

Physicians have sought in vain for substances that can renovate the broken human body. Failing to find them they have explored other fields and we have, as a result, antitoxins, serums, and germicides.

Commercial scientists know that they cannot put back into bread from the hands of chemists those things that come only from the hands of God.

Colostrum, the first food of the human being, is as we have seen the first food of all mammals, yet its exact rôle is not fully understood by scientists. From the nature of its composition, its corpuscles, salts and colloids, fats, sugars, proteins and anti-bodies, it is inferred that it furnishes to the new-born child, during its adjustment to its new surroundings and the full expansion of its lungs and the awakening of its digestive pro-

cesses, an adequate nourishment of a character similar to that which it received from the placenta as a fœtus.

Commercial scientists might as well try to produce synthetic colostrum, synthetic blood, a synthetic spinal cord, a synthetic nervous system, a synthetic brain, and a synthetic soul as synthetic bread. The most colossal impertinence now visible in this world of confusion is the effort of man to duplicate in ignorance and presumption, by a process of extravagant theorising, the handiwork of the Creator.

An army of investigators has proved that artificial mineralisation with respect to food is impossible.

The extensive research conducted by M. S. Maslow at the Institute for Experimental Medicine at Petrograd, with regard to the biologic importance of phosphorus for the growing organism and its action on the intracellular ferments, would alone be sufficient to confound the plaster of Paris scientists if they had ever heard of it.

Apparently really scientific experiments, proving that synthetic phosphates cannot be substituted for the highly complex organic phosphorus compounds of natural food and that synthetic phosphates should not be given for therapeutic purposes, have no meaning for men who by adding calcium sulphate to bread would have the world believe that they transform its inadequacy into the wholesomest of human foods.

The scientist responsible for the plaster-of-Paris bread ingredient has given to the press this interview:

"In the milling of flour more and more of the outside of the grain has been taken off in order to get absolutely white flour, thus accounting for the contention that flour is not as nutritious as formerly.

"By the addition of lime and other beneficial salts the qualities removed in the effort to get white flour have been restored to the wheat and other advantages have been noted.

"My associates in the laboratory work maintain that our findings have resulted in the most important food discovery in years.

"The so-called secret process was kept so only because of a desire to have world-wide patents on the invention before courting publicity."

In his testimony at the attorney general's inquiry, 199 Broad-

way, Tuesday, March 2nd, 1915, the vice-president of the Blank Baking Company declined to reveal the process which he claimed as his, being content with saying that it had accomplished great good for humanity.

There is other testimony, dating from the year 1490 B. C., on this subject of white flour destruction, which the attorney general's inquiry did not record.

In the twenty-sixth verse of the twenty-sixth chapter of Leviticus, or Vaicra, as the Hebrews call it, it is written that as punishment for the crimes of man their bread would undergo degeneration; that the staff of life would be broken; that no matter to what extent it might be manipulated, even to the extent of having ten women oversee its baking in the same oven, and no matter how carefully it might be weighed out, the people would eat only to find it a worthless and foodless food.

Food that does not fill is not food. These are the exact words of the prophecy:

"After I shall have broken the staff of your bread, so that ten women shall bake your bread in one oven, and give it out by weight and you shall eat and shall not be filled."

Uttered 3,408 years ago, this prophecy has been fulfilled. Its fulfilment stole in upon humanity quietly, stealthfully, unnoted. Twentieth century science has demonstrated its truth. The microscope and the test tube have confirmed the description of Leviticus of the white bread of 1918.

§ 83—DOLLARS DICTATE TO SCIENCE

The work conducted, 1914, 1915 and 1916, to determine the ravages of a demineralised diet, by Goldberg, Warring, Willets and Wheeler, at orphanages in Jackson, Mississippi, and at the farm of the Mississippi State Penitentiary, was not designed to disclose truths which the millers would at once confine in a commercial straight jacket.

But—their power over science is complete, and so when the United States Public Health Service, April, 1916, published a

warning bulletin by Voegtlin, Sullivan and Myers, they had no difficulty in silencing it.

That Government bulletin declared that the roller mill system deprived flour of valuable food constituents. That if animals are fed on highly milled wheat and corn they will die within a month or two, whereas they will live in perfect health for many months on an exclusive diet of unmilled wheat or corn.

It also described the dangers incident to the excessive use of baking powder, which destroys the vitamines of the grain.

The flour millers immediately swooped down upon the United States Public Health Service, whereupon in September, 1916, a "correcting" bulletin was issued. The government had been terrified into acquiescence by the dignity and power of the industry offended.

This "correcting" bulletin, for the consolation of the millers, told the people to be sure to obtain an adequate mixed diet to supply sufficient of the essential dietary components outside of the refined cereal contained in the diet, but not to be worried over the dangers of white flour as previously described.

The millers asserted that the Government bulletin had occasioned so much alarm that the production of highly milled flours had fallen off nearly 25 per cent., and the flour industry had been hit hard in a financial way; hence the effort of the government to re-establish the prestige of refined highly milled wheat and corn.

No wonder Assistant Secretary Vrooman of the Department of Agriculture declared, May, 1917, "The most powerful food lobby ever assembled at the Capitol, is here stimulating press agents and commercial scientists to promote the interests that gamble in human health and that seek by every means in their power to prevent the government's control of the grain elevators and patent flour mills of the country."

No wonder the Life Extension Institute declared in a bulletin: "Destruction of food is an injury to our country just as positively as destruction of munition or arms, and the commonest and most inexcusable destruction of food is the milling of wheat."

No wonder Professor Alonzo E. Taylor, Herbert Hoover's assistant in the Food Administration, asserted, "A 76 per cent. flour represents the peak of the curve of utilisation; the other 24

per cent. of the grain would be wasted if consumed by the human being."

No wonder the millers released for publication this "peak of the curve of utilisation" story to newspapers and magazines. The sophistry of this desperate effort to save patent flour for the multitude is as transparent as it is false.

In 1889 G. Bunge, professor of physiological chemistry at Yale University, demonstrated that the unabsorbed protein of whole wheat bread was 30 per cent. Of course this unabsorbed protein was not utilised, but Bunge also demonstrated that the unabsorbed protein of lentils was 40 per cent., of carrots 39 per cent., of potatoes 32 per cent., of cabbage 18 per cent.

If "the peak of the curve of utilisation" were applied to other food as the millers would have it applied to patent flour, we would not eat lentils, carrots, potatoes or cabbage without refining them as patent flour is refined.

Bunge also demonstrated that the unabsorbed protein of milk ranges from 7 to 12 per cent., for which reason we should refine milk also before permitting our children to consume it.

"We must see," declared Bunge, "that the diet of human beings does not lack woody fibre, bran or cellulose. The excessive fear of 'indigestible' foods which prevails among the wealthier classes leads to debility of the intestinal muscular walls."

Whole wheat contains 2.5 per cent. cellulose.

"Do not eat cellulose," cry the millers and their scientists. But strawberries contain cellulose to the extent of 2.3 per cent., radishes 2.8 per cent., beans 3.6 per cent., grapes 3.6 per cent., pears 4.3 per cent., raspberries 6.7 per cent., raisins 7 per cent., hazelnuts, almonds, walnuts and hickory nuts between 3 and 7 per cent.; asparagus, canteloupe, watermelon, mushrooms, apples, and celery contain as much cellulose as whole wheat.

Let us therefore eat none of these foods if we would bask under the shadow of "the peak of the curve of utilisation."

We must eat no more fruits or vegetables, and particularly must we avoid spinach, and lettuce, if we accept the warnings of men upon whose successful efforts to protect us from cellulose depend their fortunes.

The scientists know that the ability of the body to absorb

every atom of the various nutritive elements of any given food does not and cannot determine the value of that food.

They know that the truck horse, the dairy cow and the beef steer are unable to absorb any more of the wheat, the corn or the oat than is man himself.

"The peak of the curve of utilisation" suddenly loses its power when they sell cattle feed to live stock men. They know that the unabsorbed per cent. of grain foods is so heavy in the case of animals that the droppings of a single steer are sufficient to sustain a hog.

They know that the United States Government recommends to farmers the raising of hogs in this manner as an economy. They tell us that even a 76 per cent. flour will not keep indefinitely and that the loss through decomposition would greatly exceed the gain secured by milling all of the wheat.

Again, as we have seen and as we shall continue to see, they lie, but all commercial lies will reveal themselves to our children when their chicken feeding experiments are conducted in the schools.

§ 84—THE AWAKENING OF THE TEACHER

Through the awakening of the teacher the children will learn why gluttony is one of the seven deadly sins; why all nature is conspiring to teach them the folly of trespass against the natural law in respect to food; why there is something erroneous about the popular conception of gluttony when it is looked upon as the act by which an African entering a watermelon-eating contest succeeds in so distending himself with watermelon that he can't walk.

They will learn that gluttony is the deliberate and wilful act based on ignorance, indifference, or sloth, whereby an otherwise rational human creature refuses in his selection of food to recognise the fact that the laws of nutrition which apply to the health and success of the stock farm also apply to him, by reason of which he thoughtlessly eats and causes his children to eat things he would not feed to poultry, horses, cattle, sheep or hogs.

They will learn that it is quite impossible as a regular daily

occupation to eat too much of the right kind of food; that the right kind of food nourishes and invigorates; that the wrong kind of food tears down; that true invigoration is reposeful and normal, and is never tempted to excess.

In recalling the experiences of the *Kronprinz Welhelm* poison squad they will contrast the facts developed by feeding 500 men throughout an enforced experience that endured for 255 days with the nonsense of the short-time nutritional experiments such as those conducted in commercial laboratories and by the referee board, in which after a few short weeks' diet on some one suspected food or food adjunct a whitewashing report, which means nothing, is given to the world.

They will grasp the fact that at the end of 150 days a clean bill of health could have been given to the food of the sailors of the *Kronprinz Wilhelm,* thereby reducing that now classic episode to a resultless short term "scientific" experiment.

They will grasp the fact that the ordeal suffered by the German sailors went beyond the 150-day limit, and that even if it had ended at the termination of 200 days a complete whitewash of the food of the men, while still possible under the so-called scientific methods usually employed, might have had some curious doubts to explain away.

They will grasp the fact that at the end of 255 days there was no further room for doubt.

When school children begin, as a matter of classroom duty, to look into their own mouths the facts concerning their teeth will be correlated with their own chicken-feeding experiments and interpreted to the physical betterment of the nation.

§ 85—MORE TESTIMONY

The natural bond between the chicken feeding experiment of the school children and the school children's teeth is not difficult to locate.

Dr. Louis Goldstein, New York City, says:

"After examining the teeth of not less than 400 school children in my home neighbourhood here in the Bronx I have yet to see

a perfect set of six-year molars (first four permanent teeth to appear in childhood). These teeth in nearly every instance were entirely decayed. I have never observed a perfect set of teeth in any American child and have but one adult patient showing extremely good teeth. She is a young woman."

Dr. Burtice E. Lawton, New York City, declares: "Our faulty teeth are undoubtedly the result of an impoverished diet. We see many defective teeth among those in the best walks of life. Heredity does not seem to greatly increase the condition, for at present I have a patient undergoing treatment—a girl—who is the child of strong, robust parents.

"For the past three years I have observed her teeth on an average of once a month. Her teeth have virtually been starved and are suffering from the absence of a sufficient quantity of lime salts. Had she been fed on good, old-fashioned whole grain breads and breakfast foods when a youngster she would not be compelled to come under my care now."

Dr. E. A. Crostic, New York City, declares: "No one in New York City is eating the proper food these days. Foreigners who come here with a history of natural foods behind them possess solid tissues.

"Thirty years ago when the occasion arose people could sit in a dentist chair and have several teeth extracted without wincing. To-day, so lacking in nerves, energy and vitality are our women, that almost any of them after the ordeal of one or two extractions is on the verge of collapse."

Dr. Robert W. Taggert, New York City, declares: "The six-year molars are decayed and in many cases completely gone by the time the child attains the age of seven or eight years. It is almost impossible to save these teeth in any instance.

"German parents, who grew up on the whole wheat and rye bread of their native land, prior to the introduction of refined bread, have better teeth than their children."

Dr. Samuel C. Newman, New York City, declares: "You cannot beat the Italians for good teeth. They rarely have more than one or two teeth missing, the others being perfect and as hard as rocks. To drill into their hard tooth substance means to dull burr after burr in the attempt.

"Among the city children of my locality I find soft and sensi-

tive teeth. The six-year molars are usually gone and in some instances I have observed that they do not last longer than six months after their eruption."

Dr. I. H. Knopf, New York City, declares: "The Italians, who do not eat dainty food, have fine teeth. This fact is significant."

Dr. Anton J. Haecker, New York City, declares: "Twenty-five years ago I had the opportunity of examining the teeth of the school children of Worms, Germany; 250 families, existing entirely on whole grain and vegetable foods, were living within a school district at that time.

"I could pick out the children of these families from among the others readily for the reason that their cheeks were rosy and they were the picture of health. The fine condition of their teeth as compared with the others was little short of amazing.

"Their diet consisted exclusively of whole grain bread, vegetables and fruit. The inhabitants of the famous Black Forest district of Germany and the lumbermen of the Vogelsburg mountains have wonderful teeth and are in rugged health.

"On Sunday quite often one pound of meat must suffice for the appetite of eight people, the main foods being black bread, potatoes and rye flour soups."

Dr. W. E. Andrews, New York City, declares: "The teeth of Slavs, Bulgars, Russians, and Poles are ordinarily perfect. I have lately seen the grinders of an old Slav, 61 years of age, who works in a nearby coal yard. Not a tooth was missing. His childhood diet of black bread and fish had given him an indestructible tooth structure."

Dr. C. R. Kelly, New York City, declares: "Periods of disease in children marked for general nutritional disturbances in which tooth nourishment is for a time completely shut off leave their traces like sign-posts on developing teeth."

Dr. Charles A. Dubois, New York City, declares: "The elimination of starch and sugary foods, including candies and syrups, from the diet is essential to the treatment of pyorrhea. There is no such thing as local tooth disease. The condition that leads to decay is always systemic."

Dr. F. A. Sterling, New York City, declares: "Natives of Africa whom I have examined have possessed teeth in perfect condition, due entirely to their living on coarse, natural foods.

I have observed that the nearer people are to primitive nature the better are their teeth. Savages all have good teeth. The coloured race, particularly those living on whole corn meal and the unrefined sugar cane diet of the southern plantations, have good teeth.

"In one generation, in advancing from the southern corn fields and cane brakes, the teeth of our coloured children become very poor."

Dr. J. Archambeau, New York City, declares: "The people of the British West Indies (Jamaica), subsist on yams, vegetables, bananas, sugar cane, in abundance, a little salt fish and very little meat. Decayed teeth among these people are very rare. Most of their teeth look as though they were fashioned from ivory. Only poorly nourished people develop pyorrhea.

"Since the natives of the British West Indies have begun to import American delicacies I have had much fear for the future condition of their teeth."

§ 86—COURAGE OF SENIOR SURGEON BANKS

In 1917 the corn flour millers ardently supported the recommendation of the Federal food authorities to mix from 15 to 30 per cent. of denatured corn flour with 85 or 70 per cent. of denatured wheat flour.

The millers of denatured wheat flour vigorously opposed these recommendations of their corn rivals and employed chemists to combat them. These two opposing trade interests thus provoked a bitter controversy over the mixing of two products, both denatured, both of them used on an ever-increasing scale.

Into this controversy crept no hint of the warnings of the United States Public Health Service and the Life Extension Institute.

Testifying for the millers, Robert M. French of the French-Pancose Laboratory employed by the New York Produce Exchange, went before the Senate and House Committees on Agriculture, telling them corn and wheat ought not to be mixed; that whole wheat would not keep; that whole corn meal would not

keep, and that all the advantages obtained by eating the whole grain would therefore be offset by losses due to spoiling.

Finally the campaign of the millers of denatured flour to force their standards upon the army, navy and civilian populations of the United States became so scandalous that Senior Surgeon Charles E. Banks of the United States Public Health Service issued a statement which, notwithstanding its withering force, has been consistently disregarded by all American authorities.

Undaunted by the war emergency pretexts which ever tend to silence even the voices of outspoken men, Dr. Banks courageously and valiantly said:

"I read with considerable amazement but not with surprise the statement made by Robert M. French, a chemist in the employ of the Produce Exchange, evolving another of the various forms or THROWING A SCARE into the public mind lately adopted by the patent flour interests.

"French says, 'If the quacks and jingoes who preach whole wheat flour were to have their way bread of any kind would become a rarity.'

"This is his special form of scare. Another scare recently appearing in the *Northwestern Miller,* a journal devoted to the interests of patent flour manufacturers, amounts in effect to the statement that whole wheat flour will produce typhus fever.

"Again, a large miller in a public interview threw another scare into the people by declaring regretfully that he was afraid if whole wheat were used for bread it might cause dyspepsia.

"Still another contemptible insinuation published in a flour trade journal was that the Belgians were starving because they could only get whole wheat bread—contemptible, I say, because this sorely stricken people can scarcely obtain anything to eat, and their tragedy is being exploited to frighten the American public into swallowing henceforth the only material the millers intend to make, unless compelled to do otherwise, a starch flour—just starch and nothing else of consequence.

"The present milling percentage reached in producing this patent flour does not exceed 75 per cent. of the grain, thus discarding an entire quarter of the crop as a tribute to the white flour fetich. This quarter of the crop, containing the rich elements of phosphorus, potassium, calcium, iron and the other

mineral salts and vitamines of the grain, is sold by the millers as 'feed' for animals. The tissue-building elements of the grain thus go to the animals while the millers sell for human consumption the starch as flour.

"It is not necessary to confuse the lay public with the physiochemics of the digestion of starch except to say that starch is not an element of the body and to get anything out of starch for the body it must be converted into something else.

"The end result is what is the matter with the American people to-day, physically forty inches around the waist at the age of forty and so on, an inch for every year, a puff for each eye, and a bag for each cheek. The present milling methods are only thirty-eight years old and were devised for mechanical reasons solely because the old stone grinding was too slow. There was nothing of a dietetic or hygienic character which demanded this improved roller process to take care of the rapidly increasing size of our crops.

"Not content with this new process, which simply got out the starch more readily, the millers later invented an artificial bleaching process for the purpose of further refining the already deathly pallor of their product. This is refinement run mad and the housewives of America have been led through ignorance to believe that the whiter the flour the better or purer the product.

"A pale, anæmic generation of people has grown up under its continued use, as any medical man can testify who has had extended opportunities to examine hundreds and thousands of American boys physically, comparing them with the youths of the nations of Europe who have a whole grain diet.

"Our forefathers ate whole wheat bread for nearly three centuries, and if the absurd shrieks of the patent flour prophets of disaster were worth controversy it would only be to say that our hardy ancestors, men of brawn and vigour, who knew nothing of the bled-white wheat flour sold to-day, ought to have starved or died of typhus fever, and the lucky survivors should have built a museum to exhibit the last loaf of the old, deadly bread for their descendants to gaze upon.

"These athletic grandsires of ours who got the elements from the wheat which produce muscle, blood, bone, and nerve tissue, enabling them to do pioneer work and to live to old age, might

well ask the starch contingents what sort of tissue starch makes, advising them that if starch has any advantage in this line it would be well to present evidence of its superiority instead of abusing the champions of whole wheat as quacks.

"These patent flour people are not quacks. They are rather apostles of the doctrine of frightfulness, and if they are successful in forcing the American public to live on denatured cereals, America will eventually become a race of physical degenerates."

§ 87—THE TRADE CHALLENGES TRADE LIES

Dr. Banks thundered in vain. At Hotel Sherman, Chicago, May, 1917, the American Master Bakers, at a convention assailed all proposals to mill a larger percentage of whole wheat. They went so far as to send a message to Herbert C. Hoover, disapproving of any official action to compel the milling of a higher percentage than 81.

At the convention Solomon Westerfeld, vice-president of the New York Retail Grocers' Association declared: "The American stomach will not stand whole wheat bread."

The convention then passed resolutions declaring, "Whole wheat will not keep; it spoils." Yet during the four years preceding that extraordinary resolution the quantity of whole wheat bread baked weekly in New York City and Brooklyn had increased to 50,000 loaves.

The American stomach not only stood this whole wheat but the whole wheat did not spoil.

The irony of all these sordid, selfish and unpatriotic protests against the physical welfare of the American people is disclosed when we learn that while the millers were lobbying not only in Washington, but all over the country, in their desperate efforts to perpetuate the old profitable system, the Washburn-Crosby Company were circulating hundreds of thousands of booklets, advertising the merits of its Wheat-A-Laxa Whole Wheat Flour, containing 100 per cent. of the wheat.

As if to rebuke the hypocrisy of the millers, the Washburn-Crosby Company declares: "Our whole wheat flour fulfils to

the letter the requirements of the United States Health authorities. Being the whole of the wheat it contains all the life-sustaining elements of wheat in sufficient amounts to supply the proportion of the daily requirements of the body in readily digestible form.

"It represents what our great instinctive food and dietetic experts through all ages have affirmed—that whole wheat flour is a complete food for the human body."

Here was another kind of commercial voice crying in the wilderness, but America's food authorities could not hear it.

The Washburn-Crosby Company by its own confession does not believe that whole wheat bread killed Belgians, as reported by Herbert Hoover, or that American stomachs will not stand whole wheat, or that whole wheat produces typhus fever, dyspepsia, and will not keep.

At the same hour W. K. Kellogg, advertising "Krumbles," made of 100 per cent. whole wheat, published the following advertisement:

"Krumbles makes sturdy boys because it is made of the whole of the durum wheat with all its mineral salts, the thing that doctors say all children need."

The Shredded Wheat Company declared at the same time that whole wheat was an ideal food, easily digested, containing all the salts necessary to the health of the human body.

The Postum Cereal Company, manufacturing Grape Nuts, has spent hundreds of thousands of dollars to exploit what it calls a whole wheat product.

The H-O Company, manufacturing thousands of tons of "Force," made of whole wheat, denies that whole wheat will kill Belgians, produce typhus fever, or cause dyspepsia.

The Bennett Biscuit Company, manufacturing Wheatsworth Biscuits, made of whole wheat, stands like another tower of might against the selfishness of industries whose hearts remain hard even under the lamentations of war.

The Pillsbury Company, putting one of its by-products into fancy packages, and spreading the truth concerning its medicinal qualities through the advertising pages of newspapers, magazines and medical journals, contradicts sweepingly all the statements of the commercial scientists and flour millers, whose treacherous

and flimsy arguments, based on stubborn disregard of truth, stand forever against them as an indictment and a conviction.

§ 88—CALCUTTA AND THE RICE PLAGUE

As if to contribute to the confusion of America's war efforts to solve the bread problem of her allies as well as her own, the *Indian Medical Gazette,* published in Calcutta, first quarter 1917, in an editorial, "The War and Burmah Rice," declared that polished rice, the counterpart of patent wheat flour and corn flour, is not fit to eat.

"Dr. T. F. Pedley, health officer of Rangoon, points out that the craze for polished rice (deprived of its germ and mineral cells) is a pernicious mistake. The more highly polished the rice the less valuable it is as a human food," asserts the Indian authority.

"Pedley shows that the brightly polished white rice sold in grocers' shops in England, is neither nutritious nor tasty, and that this accounts for the very poor opinion entertained by English people of the value of rice as a food.

"Pedley advocates the pushing in the home markets of natural whole Burmah rice, which is both tasty and nutritious.

"The fancy trade names 'Patna,' 'Bassein,' 'Carolina,' have no geographical significance. They merely designate the whiter, more tasteless, more unnutritious and higher priced rice.

"In Bengal bazaars much Rangoon rice is sold. It is generally whiter than the home-grown Burmah rice made in the Denkhi, but still not the highly polished stuff sold at high prices in Europe.

"In Calcutta it is only too clear to judge by the pernicious smoke chimneys that rice mills are multiplying in the land, and are doubtless paying concerns, but the public should be taught that polished white rice is inferior in nutritive value to the rougher reddish or brownish rice, unpolished.

"Whole brown rice is as superior to polished rice as was the old-fashioned oatmeal made by the local village miller, to the oat food with fancy names now sold in every shop.

"This unnutritious polished white rice is the main cause of malnutrition among the rice eaters of the East."

While America stood in bewilderment over her bread policy, from every quarter of the globe came these significant contributions to the literature of decay and death now being compiled by millers the world over.

The governments of many nations at war filed away the truth, and the commercial interests, fattening on the anemia of the world, kept it filed away.

Food commissioners, administrators, directors, bureau chiefs, secretaries and under-secretaries had no word to say on the subject except that they were afraid to kill people by feeding them with food as it came from the hands of God.

None of them seemed to believe that God might be trusted in His scheme of providing for the nourishment of the world. But of this they were sure; the boards of directors, the mill proprietors, the stock owning banks and the advertising agencies knew more about the laws of nutrition than the Creator who formulated them. Yet July 27th, 1917, Senator Borah publicly referred to God as if God really had existence, saying: "This is a time for prayer."

It would be prayer indeed that would smite the creatures who, sending from their advertising agencies plates and matrices to every country newspaper in the United States, urge the people not to abandon their white flour diet.

These corrupting lies are as contemptible as the lie which informed the world that whole wheat bread killed a thousand Belgians.

A war of sacrifice should include in its plans the wiping out of special privileges at home. These evils may pay huge dividends to a few, but they perpetuate a cold, bloodless, conscienceless scheme of presumption which collects tribute from the helpless masses.

§ 89—A PARADOX

As if to laugh at the facts, the February, 1918, number of the *Forecast* came out with a repetition of the statement of Herbert

Hoover, discouraging the use of whole grain bread because he believed that "the whole grain bread fed by the Belgian Relief to the unhappy subjects of King Albert killed at least a thousand of them."

This story, which refused to die, followed closely on the heels of a statement published by Professor Alonzo E. Taylor over a preface written by Herbert Hoover himself, urging the use of whole grain foods because they contain substances which when not present bring about serious conditions of malnutrition resulting in death.

This strange paradox disclosed a condition of official vagueness in the Food Administration, where sharply outlined truth alone should have existed.

"Much more mineral matter is contained in grain offal than in patent flour," says the Hoover-Taylor statement. *"Individuals who prefer bread made of patent flour must therefore secure their mineral salts from fruits and vegetables, and this is entirely practicable. If, however, it is not possible to secure fruits and vegetables then the diet must contain flour made of the whole grain in order to obtain the necessary mineral matter.*

"Cereals contain the water soluble vitamine in the outer layers, and it is therefore not present in patent flour, but is present in whole wheat flour."

The authorities at Washington knew according to the most reputable authorities that at the outbreak of the war 2 per cent. of the people of the United States owned 60 per cent. of the wealth; 33 per cent. of the people—the middle class—owned 35 per cent., and the remaining 65 per cent. of the people owned 5 per cent. of the wealth.

They knew that war activities had sharply accentuated this concentration of wealth and further reduced the holdings of the many whose war incomes, although inflated, did not keep pace with the rapidly advancing prices of foodstuffs.

They knew that the immigration commission which reported in 1909 upon the incomes of nearly 16,000 families whose bread winners were engaged in industrial pursuits found the incomes of 64 per cent. of them below $750 a year, and the incomes of 31 per cent. below $500 a year, the families averaging 5.6 members each.

Even then 8,000,000 women were industrially employed in America, two-thirds of them receiving less than $8 and nearly one-half receiving less than $6 a week.

Two million of these women were described as "adrift" from home. They were entirely self-supporting.

Five million, four hundred thousand women who lived at home contributed largely to the support of parents and other dependents by pouring their earnings into the family purse.

A hundred authorities had told us in the most emphatic terms of the necessity of putting into the bodies of these people the important substances withdrawn from so much of their food.

Professor Taylor himself says that 55 per cent. of their food consists of bread, and by that he means denatured bread.

As if to accentuate these truths as a preparation for America's entry into the war, the Association of American Physicians met at Washington, May, 1916, with Dr. Henry Sewell of Denver in the chair.

At that convention, the 31st, Dr. E. J. Wood of Wilmington, N. C., presented long neglected evidence to show the deadliness of the deficiency diseases which he declared have been far more specific than is thought.

The theory that the people were getting their offsetting minerals and vitamines from fruits and vegetables had long been battered down, but as a theory it still persisted in high places, as in the Food Administration.

Dr. Wood declared: "Refined corn meal, polished rice and patent flour are deadly foods. We have proved this by experiments in which we provoked outbreaks of disease by feeding highly milled meal to our victims, and in every instance promptly correcting the disease by feeding whole meal."

Dr. Alfred S. Hess at the same convention declared: "Whereas Dr. Wood has found the germ of corn, always bolted out in making refined corn meal, to be a sure cure for deficiency diseases, I have found the wheat germ always bolted out in making white flour, a sure cure for malnutrition in infants."

Yes, confusion rests upon the multitudes. Their scientific leaders, who have no political, state or federal authority, seek to lead them out of their perils. Their scientific leaders who do possess authority are strangely content to let them rest where they are.

SEVEN: WHY FAMINE FOLLOWS THE USE OF ARTIFICIAL SUGAR

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§ 90—OLD BROWN SUGAR

Old men and women consume little or no sugar. Babies that live consume very little. Sugar-eating infants do not survive. Men who drink alcoholic beverages rarely eat sugar. The victims of diabetes avoid sugar.

Thus a large element of our population consumes sugar sparingly or not at all. In spite of this the Department of Commerce shows the average consumption of cane sugar in the United States for the year ending June 30, 1917, was eighty-one pounds for every man, woman and child.

These figures covered cane sugar only. Another sugar debauch in the form of glucose candies, corn syrup and table syrup made of glucose and refiners' syrup was not included.

Combining the various forms of refined sugar and eliminating infants, the aged, whiskey drinkers and invalids, the average annual consumption of refined sugars in the United States is at least one hundred and fifty pounds per person.

The figures of the Department of Commerce show that in Germany the consumption is sixteen pounds, in France twenty-eight pounds and in Great Britain thirty pounds. America has become a nation of refined sugar hogs.

What are the facts concerning the effects of excess sugars in the diet, and what does such excess mean, in terms of degeneration, to the future of this country?

Sugar, as now manufactured, yields only heat to the body. Sugar is "purified" fuel burned in the tissues without contributing any of the salts, vitamines, biochemic reactions, building or repair material indispensable to health.

The end products of its combustion are acids. When it is considered that the American people already consume in their refined breadstuffs, breakfast foods and meats, enormous quanti-

ties of acid-producing foods, the sugar bombardment becomes threatening in the extreme.

I use the word "bombardment" because it expresses the facts exactly. In our excessive consumption of refined foods we are bombarding the entire nation's defence against disease; and refined sugar, heaviest of the artillery, is rapidly breaking down our resistance against these great enemies of the human family, anemia, tuberculosis, pneumonia, heart disease and diabetes.

In the days when we were eating unrefined grain products and unrefined sugars we ate more vegetables, fruits and greens, from all of which are obtained the basic or alkaline substances needed by the internal secretions. These alkaline substances keep the blood and other body fluids in the state of normal alkalinity essential to health.

Then appeared our first grave dietetic error almost simultaneously with the introduction of highly milled grains, the abnormal starch content of which must be converted in the body into sugar before it can be utilised. The body makes its own sugar, all it can use, from non-sugar foods and even though deprived of every form of commercial sugar, man, woman or child can and does obtain all the fruit, vegetable, and cereal sugars necessary to health and life.

Sugar became popular because, as our mothers and grandmothers knew it, there was good reason for using it in generous quantities. Not only was it far more flavourful but incomparably more nutritious than the refined products of modern times, upon which we are gorging ourselves at the expense of teeth, blood, bone and tissue.

Twenty-five years ago old-fashioned brown sugar, manufactured on the sugar cane plantation, was in common use. Such sugar possessed not only all the sweetness of the cane but also its aromatic and nutritive substances including the mineral salts no longer present.

Maple sugar can be refined until it, too, is as white and flavourless as granulated cane sugar, beet sugar, glucose or corn syrup.

The delicious flavour of maple sugar is due to the presence of "impurities" derived from the sap of the maple tree. The delicious flavour of old-fashioned brown sugar is due to the presence of "impurities" derived from the juice of the cane

The elimination of these impurities yields a colourless, but sweet product.

To-day we do not know whether our refined sugar is derived from the honey reed, now known as the sugar cane, or from a beet root. All we know is that it is sweet. Whence it comes, what curious processes it passes through on the way, how it affects the body when it arrives, are questions never asked.

In the old days when Louisiana was producing old-fashioned brown sugar and when a clean, wholesome, old-fashioned brown sugar was manufactured in the West Indies, the refiners, grasping at ways and means of earning greater profits, conceived the idea that if they could prejudice the public against brown sugar nobody would buy it.

So they started to drive out of the American market all the old-fashioned brown sugar then made on the cane plantations.

My work has made me unhappily familiar with many food crimes which, by their very nature, cannot be punished. This crime was literally a conspiracy against the human race, and its consequences are now to be reckoned with although no body of laws exists with which to meet them.

The refiners knew if they could prejudice the people against the use of brown sugar, thus destroying the market for it, they could then buy it up, refine it, and control its distribution, thus securing a profit on every pound of the raw material that every planter produced.

In the old days the manufacturer of brown sugar shipped his product direct to market. The refiners did not touch it on the way. Of course they were unable to collect tribute from such a system.

To get control so that all the producers would have to send their raw sugar through the refiners' hands it was necessary to kill off the demand for brown sugar. To kill off the demand it was necessary to disgust the people with all brown sugar so that their appetite for it might be destroyed.

To accomplish this they inaugurated one of the most violent advertising campaigns ever witnessed in America. In 1898 they were ready to "educate" the public and educate it they did.

§ 91—NEW WHITE SUGAR

The advertisements of the brown sugar exterminators consisted obviously of an attack upon old-fashioned brown sugar. Each advertisement was accompanied by a picture said to be an enlarged photograph of a dreadful looking animal described as a cross between a louse and a lizard.

To prove such a creature lived in all brown sugar they went to Dublin and dug up a commercial chemist who, like many other commercial chemists now earning fat fees by furnishing "scientific" support for many food indecencies, was willing to certify, for a consideration, that he had found this louse-lizard-monster in brown sugar.

One of the advertisements, which I quote word for word from the Congressional Record, read as follows:

"Professor Cameron, public analyst of the City of Dublin, who has examined samples of raw sugar, states that they contain great numbers of disgusting insects which produce a disgusting disease."

The advertisers did not say what disease. It was enough for their purpose to say it was a disgusting disease. They knew they were lying but the American public, long fed on advertising lies, swallowed the statement and asked no questions.

"The shape of these disgusting insects," the advertisement continued, "is very accurately shown in the accompanying photographs magnified two hundred diameters. It is a formidably organised, exceedingly lively and decidedly ugly little animal. From its oval-shaped body stretches forth a proboscis terminating in a kind of scissors with which it seizes upon its food. Its organs of locomotion consist of eight legs, each jointed and finished at its extremity with a hook.

"The number of these creatures found in raw sugar is sometimes exceedingly great and in no instance is raw sugar quite free from either the insects or their eggs. Brown sugar should never be used."

Now comes the devil from behind the stump, and here is what the devil said through the medium of this advertisement.

"It is fortunate, however, to note that these terrible creatures do not occur in refined sugar of any quality. Use only refined sugar."

Our mothers and grandmothers were horrified. Wherever they looked they found a picture of the disgusting louse-lizard-monster. They saw the dreadful creature in all their delicious desserts and dainties. Their fruit cakes, muffins, cookies, brown bread, taffies, candies, hard sauces and other good things suddenly appeared before them as horrible sepulchres in which reposed the dead bodies of vermin.

One after another the advertisements appeared. The Dublin professor became famous and the American public writhed in disgust.

The brown sugar industry, as far as the housewife was concerned, was completely destroyed.

Wholesale bakers' supply houses, unknown to the housewife, continued to handle the stuff in carload lots and the retail bakers fed it, without arousing their suspicion, to the poor creatures who wouldn't dream of using it in any home-made product.

The poor plantation owner who made brown sugar just as maple sugar is made to-day, found his market closed to him. His only means of disposing of his raw sugar was to sell it to the refiner. This is what the refiner wanted and this is what he got.

Just as the farmer used to send his grain to the local grist mill but was gradually forced to ship it to the centralised roller mills, thereby losing control of his product and furnishing enormous profits to a few highly organised groups of money makers, so also the planter found it necessary to do business with a few monopolists or quit.

Through the louse-lizard-monster the American people have been deprived of a luxury which there seems to be no hope of restoring to them unless, grimly determined to act for themselves, they decide to discourage the use of refined sugars of every kind and thus make it necessary for the sugar interests to give them back the old-fashioned product so ruthlessly destroyed.

In the meantime they must remember that the quantity of

sugar which the human body can utilise is limited, although they are constantly encouraged to eat more sugar and still more sugar on the ground that it provides the body with heat.

Foods are neither heating nor cooling. No food has the power of raising the temperature of the body to a point higher than the normal constant, 98.4 degrees Fahrenheit. No foods are cooling in the sense that they can reduce the temperature of the body to a point lower than this same normal constant.

Sugars become heat producers only when the body's machinery of heat control breaks down. The result of such breakdown is fever. In fever the body literally burns up. Not only are the sugars of the body burned but its very tissues are burned.

The warmth so necessary to life is produced by a slow form of oxidation supported by the foods we eat.

In breathing we take large quantities of oxygen from the air through our lungs, provided the hemoglobin, or iron containing substance of the blood, is present in normal amount.

Hemoglobin carries oxygen to the tissues where it is needed and carries the waste product, carbon dioxide, away. The slow evolution of heat which accompanies this process is described as the body temperature.

In disease the oxidation or burning process frequently proceeds faster than in health. So delicately adjusted is this burning process that a slight variation of four or five degrees either way is often sufficient to cause death.

It has been conclusively established that the circulating blood cannot carry for the needs of this burning process any sugar in excess of one-tenth of one per cent. of the total volume of blood. To get more than this limited quantity of sugar into the blood circulation vital organs must first break down.

We simply cannot utilise more sugar than this fixed limit permits, for which reason the excess sugar now consumed constitutes one of our biggest waste problems.

Yet, always are we urged to consume more sugar not, as is quite apparent, for the good of our health but for the benefit of the sugar industry.

There is an organ in the body called the pancreas which in health sets up a barrier against the entrance into the blood of

larger quantities of sugar than the one-tenth of one per cent. which the blood can take care of.

Cramming ourselves with sugar in quantities never before consumed by any nation in the history of the world, we are literally overloading the pancreas, and the liver, kidneys, lungs, skin and other glands are whipped into action to dispose of the excess fuel.

How long it takes for these glands, taxed beyond their strength, to completely break down we do not know. But we do know that sugar gluttony is one of the seven deadly sins because it is a slow form of suicide.

Scientists have proved that in diseased conditions of the pancreas, although they do not know how such diseased conditions are established, all excess or waste sugar is eliminated through the kidneys.

How long the kidneys can stand up under such overloading is not known. But it is known that in America kidney disease in one form or another is constantly on the increase.

In this respect it is interesting to know that the refined and concentrated sugars do not conduct themselves in the body as other sugars, such, for instance, as honey. In another chapter I shall attempt to show the really wonderful difference between these forms of sugar.

For the present it is enough to reiterate that we are laying a sugar curse upon the heads of prospective mothers, nursing mothers, infants still unborn, growing children, bread-winners and workers. To lift this curse we must exercise control over our refined sugar appetites, cutting down our consumption until the one hundred and fifty pounds per person per year is reduced to thirty pounds or less.

Happy was the day that America learned she really could pass safely through a sugarless siege.

§ 92—SUGARITIS

While all America during 1917 and 1918 was clamoring for sugar and a Senate Committee was busily engaged in probing

into the conditions responsible for the sugar famine, the Department of Health of New York City was preparing a bulletin on the spread of diabetes, a disease in which there is such serious disturbance of nutrition that the body partially or completely loses its ability to make use of sugar in any quantity, however small.

This disease makes it impossible to utilise starch as well as sugar, for which reason foods that are turned into sugar in the body, such as potatoes, macaroni, white bread, farina, rice and corn-meal, provide no nutrition and are wasted when consumed.

From the facts set forth the public health officials concluded that diabetes has been coming more and more into prominence in recent years and that during the past ten years the disease has taken its place as a very significant factor in the nation's mortality rate.

Joslin, whose work on the disturbance of sugar nutrition is now accepted as an authority in the United States, declares that we have here not far from 500,000 individuals who either have diabetes now or are destined to have diabetes before they die.

Commenting on this startling fact the Department of Health of New York City asserts, "That this is based on something more than guess-work is clear from the careful statistical analysis presented by the author."

The outstanding feature of the alarming situation revealed by Joslin is the fact that these diseases are to a considerable extent offsetting the good effects, such as prolongation of life, which should follow the development of sanitary science in recent years.

We no longer let our garbage decompose in the public streets. We no longer permit the bodies of dead animals to rot in our back yards. In many communities the cesspool has been abolished; water purification plants have been established; the drinking water is treated with alum and then chlorinated so as to prevent the spread of typhoid. We have established quarantine restrictions, meat inspection, milk inspection, food inspection and are spending millions of dollars annually in semi-political efforts to safeguard the purity and wholesomeness of our food, our air and our water.

But, while we are lengthening life by modern sanitation and

by saving infants under five years of age who, on account of their low vitality and general weakness, used to die, we are killing off men and women in the early forties with diabetes and obesity.

Yet—it is now clear that in the development of these diseases our abnormal consumption of refined sugars and refined cereals is responsible.

Sugar in the forms in which Nature prepares it is an indispensable element of diet.

Because it is soluble it is easily carried by the blood to the muscle that needs it.

But, as we consume it to-day, sugar is not a natural, but an artificial product.

With the exception of honey there is no concentrated sugar in Nature. Very dilute sugar exists in ripe fruits and vegetables, principally in their juices.

Man has learned the trick of taking this dilute sugar and concentrating it, although Nature teaches him that he should obtain the sugar he needs almost entirely from his ordinary fruit, vegetable and cereal foods, just as his ancestors did for thousands of years before him and as animals have done since the beginning of time.

Nature provides man with a ferment found in saliva. This ferment converts the starch of potatoes, wheat, corn, rice, oats, beets, carrots and all other starch-containing seeds and roots into sugar.

By converting corn-starch through chemical treatment into glucose and by refining cane juice and beet juice, man serves notice upon his salivary glands that he has no use for them and shuns the assistance which Nature asks them to render.

So, to-day, we consume millions of tons of concentrated candy, confections, syrups and sweets of all kinds. The inevitable result is a gradual breaking down of the body's ability to make use not only of concentrated sugar but of any kind of sugar and under the terrific strain the organs of control are finally smashed and in susceptible individuals diseases, born of sugar and starch abuses, are permitted to break through and invade the body.

It is not astonishing that we now have a half million people in this country condemned to premature death by sugar.

It is not astonishing that since the abnormal increase in the consumption of sugar the last generation has recorded a fifty per cent. increase in diabetic affections.

Refined sugar and refined starch have been U-boating the stamina of America.

For a long time they did their work without leaving a trace. Scientists scratched their heads and puzzled over the facts which they did not understand. But, to-day, the nature of sugar and the diseases that flow from its excessive consumption are better understood.

There is good reason to believe that honey does not conduct itself in the body like refined cane sugar or beet sugar and it is probable that maple sugar differs in like manner.

Davidoff observed that honey was tolerated by the diabetic to whom sugar in any other form was poison. Davidoff made this discovery by the merest accident. Yet he so marvelled over it that he reported his findings to the medical fraternity.

A single instance does not, of course, establish a law. But Davidoff's single instance can be put to the test in a million instances and the results of such tests will establish a law. I have had under my observation a diabetic who suffers the keenest distress if he consumes a single cube of granulated sugar or eats a single slice of white bread. Strangely enough he can consume honey in moderation and whole wheat bread without experiencing any distress.

Nearly two years have passed since I called to his attention the phenomenon noted by Davidoff. Hesitatingly and with great reluctance he took his first teaspoonful of honey expecting to pay the price for his indulgence. He was amazed to find no reaction. A few days later he repeated the dose and again seemed to enjoy immunity. He tried a teaspoonful of honey every day for a week, at the end of which time he became a little bolder and gradually increased his daily dose of honey until now he is adding to his diet four big teaspoonfuls every day.

His experience, I believe, while significant only as the experience of a single individual, is so curiously in harmony with the experience of Davidoff that it should serve as an inspiration for further study along this line.

§ 93—THE HONEY BEE

The curious indifference of the American people towards honey has cost this country more in dollars, cents, public health and common comfort than can ever be accurately estimated.

The manufacture of refined sugar in no wise assists in the development of the nation's most important agricultural industries although bee-keeping in the production of honey results in untold riches through pollination of the food farms of the country.

Neglect of the bee, through over-emphasis of the importance of the cane, beet sugar and glucose industries, has not only resulted in the withdrawal from the human family of a sugar food and sweetener of infinitely greater value than refined sugar but it has brought failure to many a fruit district that would otherwise flourish beyond the fondest dreams of the fruit farmer.

For thousands of years the confections of the world depended upon honey for their very existence. Jacob sent honey as an offering to Joseph, the ruler of Egypt, at least three thousand years before the first sugar refinery was built.

That honey and the honey bee should have been lost sight of in the advance of civilisation constitutes one of the many curious blunders which humanity, while priding itself on its progress, is so prone to commit.

The bee is destined to benefit generations still unborn but before it can render its greatest service to humanity, humanity must learn to consume honey.

It is not generally known that in the United States we consume only 40,000,000 pounds of comb honey and 120,000,000 pounds of extracted honey annually. All this honey is gathered by the bee in the form of nectar from the blossoms of white clover, sage, sweet clover, alfalfa, willow herb, raspberry, cotton, golden rod, aster, heartsease, apple, orange, basswood and buckwheat.

The greatest living authority on honey and the man who has done more to revive the neglected bee-keeping industry of the United States than all others combined, A. I. Root. insinuates

that the 160,000,000 pounds of honey gathered by the bees of the United States every year represent but one per cent. of the total quantity which the hills, valleys, and fields of America either can produce or have been producing since the beginning of the world.

Ninety-nine per cent. of the annual crop, or a total of 15,840,000,000 pounds, is wasted every year. The enormity of this waste is almost too vast to be grasped by the human mind.

In gathering this volume of honey, which we could gather if we wanted to, every orchard in the land would be pollinated. What this pollination would mean in the production of food is almost incredible.

The Van Rensselaer apple orchard in Medina County, Ohio, tells the whole story which the farmers of America might well heed to their advantage. The Van Rensselaer farm produced on the average five hundred bushels of apples annually until its owner trimmed and sprayed his trees and began to keep bees, whereupon the production of the same orchard, with not a single new tree, leaped from five hundred bushels to sixteen thousand bushels in a single season.

Yet not so long ago bees were looked upon by the farmers of the United States as nuisances and many lawsuits have been bitterly prosecuted in order to destroy the so-called pests.

The farmer did not appreciate what a colony of bees meant to the fruitfulness of his land. But, to-day, the tragedy of bee-killing in many sections of the country is looked upon as a heinous and deplorable crime against Nature.

On the Repp Farm in Gloucester County, New Jersey, we have another experience of the bee's benevolence toward man in the production of food.

This farm is now producing 120,000 bushels of apples. Repp himself declares that so indispensable are bees to the growing of fruit in this country that fruit growers can afford to pay local bee men at the rate of five dollars a colony merely to have the bees in the orchards during the time the trees are in bloom, letting the owners of the bees take them away again at once.

Neither Van Rensselaer nor Repp are pioneers in the matter of pollinating fruit bloom through the instrumentality of the bee. They did know, however, that the old conflict between bee keep-

ers and fruit growers in which the fruit growers swore that the bees injured the bloom, punctured the fruit and interfered with the packing, was unfounded.

They knew that the fruit growers did not understand that they were driving away the very agency necessary for the proper pollination of the fruit bloom when they were fighting the honey bee as a pest.

In Massachusetts a bee keeper was obliged to remove bees from a whole district on the complaint of fruit growers that they were a nuisance. Two years later the fruit growers were glad to have the bees come back. Two seasons of fruitless orchards had taught them a lesson never to be forgotten.

Dr. Philips, of the Bureau of Entomology, Washington, actually declares that fruit orchards cannot be planted properly on an extensive scale without maintaining in connection with them numerous colonies of honey bees and he goes so far as to assert that bee-keeping adds indirectly more to the resources of the country by flower pollination than by the sale of honey and wax.

The orange growers of Florida now know what the bee means to their crops. Sweet cherry orchards have jumped from a production of thirteen tons to thirty-nine tons merely through the introduction of a few colonies of bees to the acre. Even the tomato is pollinated by the bee.

In Massachusetts alone there are now over two thousand colonies of bees pollinating cucumbers, squashes, melons and pumpkins. The grape, strawberry, blackberry, raspberry, cranberry, blueberry, gooseberry, currant, plum and pear need the bee.

In New Zealand it was found that red clover could not be cultivated until honey bees were imported from England.

Greater demand for honey as a sugar food means more bees. More bees mean more food of every kind. Love of honey is therefore one of the most productive of the forces now engaged in the growing and harvesting of crops; in the reconstruction of the world itself.

We shall certainly never have more bees until we find a market for more honey. Once the people begin to demand honey instead of the substitutes that are offered for honey they will

set up a system in America from which will flow blessings beyond price.

That God made the bee for a purpose is potent to all but astigmatic souls.

§ 94—HONEY

Honey cannot be adulterated. There is no need to go into the details that justify this sweeping statement. All the efforts of food sophisticators to imitate honey have failed.

These facts were settled for all time in a Federal District Court, Philadelphia, November 20th to 25th, 1913. The bee itself was the chief witness against the honey fraud prosecuted by the government and the records of the trial are indeed consoling in that they have demonstrated that with all man's skill and all the tricks of his laboratories he cannot successfully imitate God.

Space does not permit description here of how the ordinary female bee on a diet of special food is developed into a true queen bee with a perfect body and perfect organs suggesting what can be done for the average child if properly nourished before its birth and properly fed thereafter.

For the present our purposes are served if we learn and apply one fact in connection with our purchase of honey.

The modern bee keeper extracts honey from the comb in a rapidly whirling machine. Extracted honey is cheaper than comb honey for the reason that the empty combs can be used over and over again.

It takes from five to ten pounds of honey to make a pound of wax and when the bees are constantly required to rebuild their cells they lose just that much energy which ordinarily would be spent in gathering honey. Hence in making it unnecessary for the bees to construct new combs they are given more time to gather honey.

For years in America the average market price for extracted honey has been little more than half the price of comb honey. Most people know nothing of the difference between extracted honey and comb honey. They foolishly think all honey should be liquid as it is usually found in the glass jars on sale in the

stores. They also foolishly think that unless honey is in this liquid state it is not pure honey.

This is superstition. All honey will granulate and become solid unless heated to 160 degrees Fahrenheit and held at that temperature for a half hour or more.

Honey is heated in this way in order to keep it liquid and thus meet the ignorant objections of the uninitiated consumer.

But in heating the honey to make it satisfy artificial taste standards its finest flavours and most distinguished characteristics are lost, being driven off in the heating process.

The honey is still honey and still wholesome honey and still delicious honey but the fine aromatic bouquet has been sacrificed to a silly prejudice born in ignorance.

Another superstition of costly nature expresses itself in discrimination against the light colored honey in favor of the darker honey or against the darker honey in favor of the lighter.

The natural color of alfalfa honey, white clover honey, orange honey, basswood honey and sage honey is very light, almost water-white, with a little touch of amber. The red clover and buckwheat honeys are much darker and people who are used to these darker honeys refuse to accept the lighter honeys on the assumption that they are impure.

To overcome these erroneous ideas the honey producer is frequently forced to blend honey of all types and colours so as to get a certain uniformity. This blending in no wise affects the nutritive quality of the honey nor, let me repeat, does the heating affect its wholesomeness. But blending and heating make it quite impossible for honey lovers to gratify their taste for this or that particular kind of honey or to know anything of the true nature of honey.

To a similar extent the use of pure maple sugar parallels the results attained by the use of honey. But maple sugar is now difficult to obtain. Even at the time when the sugar famine was at its height a single manufacturer of cigarettes was purchasing more than half the annual production of maple sugar in the United States and Canada.

The last purchase of pure maple sugar made by this tobacco

concern consisted of forty carloads of 35,000 pounds each, a total of 1,400,000 pounds. The price paid was less than twelve cents a pound. Every ounce of this maple sugar went up in smoke and not an atom of it will contribute to the nourishment of the human body.

Well indeed will it be for us as a nation when we reduce our consumption of cane sugar and give more attention to the uses of honey and maple sugar.

Honey drop cakes, honey fondant, maple fritters, honey ginger cookies, honey or maple ice cream, honey butter, honey jelly, honey mousse, maple meringues, honey caramels, maple creams, honey and maple taffy are indescribably superior to the same sweets made of granulated sugar.

Honey cookies, marmalade, apple puddings, brown Betty, fruit bread, coffee cake, corn bread, griddle cakes, short cake, pumpkin pie, doughnuts, drop cakes, fruit muffins, cinnamon bread, graham biscuits, tarts, layer cake, are all improved by the substitution of honey for sugar.

The American people have given little attention to the use of honey in cookery, for which reason they are almost totally ignorant of the teasing and seducing flavour which honey imparts to the hundred and one delicious and nutritious foodstuffs to the excellence of which it so readily contributes.

For a hundred reasons, all of them compelling, let us eat more honey, but less sugar.

§ 95—GLUCOSE

Glucose as a filler is the symbol of denatured carbohydrate foods, the excess of which in the diet of the average American family is the cause of many diseases, beginning in constipation and ending in anemia, tuberculosis, acidosis, and the disorders incident to lowered resistance.

Thursday, August 26th, 1915, a prominent official of one of the large glucose manufacturing companies admitted to me that a restricted diet of denatured foods, whether glucose appears among them or not, will develop many disorders in the body.

"Because we recognise these facts," he said, "we are now

striving to give to the human animal the indispensable organic and inorganic mineral salts and colloids of the 'steep-water' of our corn syrup factory. Our corn solids are the richest part of the corn and we have tons of it to dispose of every day.

"We can actually get a better price for these substances as fertiliser than we are now obtaining for them as cattle food," he said, "but we so recognise their importance as food that we have resisted the temptation to dispose of them as fertiliser when they are so necessary to the animals that feed upon them."

According to his estimate, 80 per cent. of the glucose manufactured from corn is disposed of to bakers, confectioners, jam and jelly manufacturers and makers of other commercial foods and beverages.

In all these types of ready-made food the salts of the sugar cane are not restored through the glucose employed in their manufacture, and practically the only mineral salts in the pie, cake, pudding or candy (manufactured with glucose or granulated sugar) are the salts introduced in the form of alum and other baking powders and preservatives. These are not the salts, in form or nature, required by the nutritional processes of the body.

Probably the most serious aspect of these demineralised carbohydrate foods is the vast accumulation of evidence supporting the belief that the excessive ingestion of refined sugars and starches, so common in the diet of the American people, is a factor in the cause of diabetes which may account for the rapid increase of this disease.

Theodore C. Janeway, Bard professor of the practice of medicine in the College of Physicians and Surgeons, Columbia University, declares:

"In diabetes the tissues are in a state of partial or complete sugar starvation though they may be bathed in lymph rich in glucose. The glucose, circulating in the blood and not utilised by the muscles and cells for food, accumulates until in excess of the normal upper limit of one part in one thousand.

"This excess of glucose in the blood is called hyperglycemia. With long standing hyperglycemia the kidneys lose their power to throw off the excess glucose and the degree of hyperglycemia tends to rise progressively. It is because the appetite is frequently gratified by carbohydrate foods (sugars and starches)

that hyperglycemia is increased with no gain to the body in energy.

"Inasmuch as the diabetic has lost his toleration for sugars and starches he must be safeguarded from all influences known to diminish his tolerance. Among such influences, clinical experience teaches us plainly that hyperglycemia plays one of the chief rôles.

"Failure to institute proper dietetic treatment or self-indulgence on the part of the patient so frequently leads to the development of severe diabetes in a previously mild case that it is obvious that over-taxing the weakened power for using sugars and starches is diminished by indulgence in sugars and starches."

The evidence that it is this indulgence which sets up the morbid condition, eventually expressing itself as diabetes, is weighty and significant.

§ 96—GLUCOSITIS

"In younger diabetic patients," declares Janeway, "it is not safe to allow an amount of sugars and starches more than two-thirds of that tolerated, and they must be kept under close supervision because they are more likely to progress from a mild to a severe form of the disease, even under treatment, for the reason that they are apt to be careless and self-indulgent."

"The younger the patient the more marked are the evidences of excesses in carbohydrates," declare Friedenwold and Ruhrah, "yet we continue to encourage our children to daily indulgence in penny sweets (refined sugar and glucose), notwithstanding the abnormal proportion of refined carbohydrates which constitute the bulk of their breakfast, dinner, and supper."

If excessive indulgence in sugars and starches diminishes tolerance and causes a mild case of diabetes to progress to a severe form of the disease, is it not this very excess which sets up diabetes in the first place by eventually destroying all tolerance for such denatured foods?

Olaf Hammarsten, emeritus professor of medical and physiological chemistry in the University of Upsala, is very positive

on this point. "A hyperglycemia may be caused by the introduction of more sugar than the body can destroy. If too much sugar is introduced into the intestinal tract at any one time, so that the assimilation limit is over-reached, the glycemia is caused by the passage of more sugar into the blood than the liver and other organs can destroy."

Over-taxing any organ systematically is certain to be followed by a morbid condition in the functioning of that organ.

In the morbid condition described as diabetes the factor of most significance is always the carbohydrate factor. All the evidence warrants the assumption that this carbohydrate factor is not alone a symptom of the disease, but its actual cause.

Robert Hutchinson, physician to the London Hospital, declares: "It must be borne in mind that the assimilation limit is not the same for all individuals. Some people are able to convert more sugar into glycogen than others. Persons with a low assimilation limit are potential diabetics—that is to say, they are more liable, through sugar excesses, than others to become the victims of diabetes."

Here is a direct connecting link between sugars and diabetes. There is evidence to indicate that artificial sweets, such as white sugar and glucose, conduct themselves in the body in a manner not now understood by scientists, but with much less tolerance than is enjoyed by natural sugars, accompanied by the other food elements with which nature endows them in the raw or unrefined state.

Dr. Alonzo E. Taylor declares that all sugars are not tolerated in the same way in the body. "Levulose and lactose are sometimes tolerated and utilised better by the diabetic than is glucose," he says.

He is not clear as to the meaning of this. He simply cites it as a fact. He calls attention to the phenomenon that all the starches yield only glucose, not fructose or galactose, and there are variations in the toleration of starches of different derivations.

"The starch of the potato," he declares, "is supposed to burn better than that of corn. There is no doubt of one fact. Diabetics tolerate oatmeal better than any other carbohydrate. It is common to feed a diabetic with little glycosuria and low acidosis

100 grams of starch per day in the form of oatmeal (accompanied by its natural mineral salts), when 50 grams of glucose (hydrolised corn-starch) will pass almost quantitatively into the urine.

"For this fact, striking as it is, we have no explanation," he says.

Referring to the same phenomenon, Julius Friedenwold, professor of gastro-enterology in the College of Physicians and Surgeons, Baltimore, and John Ruhrah, professor of diseases of children in the same institution, declare:

"The different varieties of sugars and starches ingested may vary in their glycosuria-producing power. Glucose causes the greatest percentage of sugar to appear in the urine in the shortest time. Fruit sugar augments the glycosuria only to one-half the extent when given in the same amount."

Who will say that this lessened tolerance for glucose is without significance? Yet we commonly read in the magazines advice to mothers written in positive and conclusive terms: "Give your children plenty of sugar, candy and sweets. It is good for them."

Occasionally a pioneer strikes out in the direction of the truth, only to be startled by his discovery that all natural foods conduct themselves in the body in a manner entirely dissimilar to the conduct of unnatural, artificial or prepared foods.

Honey is not glucose. Glucose is not sap maple syrup or maple sugar. Glucose is not sorghum or open kettle cane syrup or old-fashioned molasses, now a thing of the past.

§ 97—WHY THE EXCESS?

We know that in health the circulation can utilise only a certain fixed quantity of glucose—0.1 per cent. (one part in a thousand parts of blood)—beyond which quantity the healthy or normal pancreas, one of the vital organs of the body, according to the investigations of Zulzer, Pfluger, Cohnheim, Minkowski, Norten, Dominicis, Kleiner and Meltzer, seems to set up an impenetrable barrier.

Well indeed may the scientist who is looking for strange reasons to explain the origin of diabetes be asked these questions: How, even in health, can the human body profit by the consumption of enormous non-utilisable quantities of starch, glucose or sugar?

How long can the body tolerate this overload or excess?

In diseased conditions of the controlling organ the excess or waste glucose is eliminated through the kidneys, yet all America is encouraged to use refined sugars, starches and glucose in enormous quantities, notwithstanding the fact that in order to pass into the circulation at all, beyond the fixed limit of 0.1 per cent., a vital organ, the pancreas, must first break down and become diseased, permitting, in other words, diabetes to develop.

It is well known that the body in health manufactures in a natural manner from the starches, gums, sugars and fats of vegetables, grains and fruits all the glucose it requires for its normal needs and all the glucose it can utilise.

As long as the body remains in health the circulation possesses the ability and readiness to rid itself of a surplus of glucose, but in the case of growing animals, old animals, animals bearing offspring, animals nourishing their young, or animals in feeble health, it is not known by any scientist to what extent the circulation, already overtaxed, possesses the power to rid itself daily of a large surplus of glucose, the tolerance toward which, as we have already seen, is decidedly limited.

There is indeed much evidence to support the conviction that under such extra burden the controlling organ (the pancreas) must succumb to the strain, thus opening the way to the development of that disease, the origin of which seems to be so mysterious, but which all men agree upon in calling it diabetes.

Pfluger concluded, as a result of his experiments, that there is a close relationship between the liver and "pancreas-diabetes," declaring that "the liver in diabetes works actively and is the most important seat of production in diabetic-sugar."

Eppinger, Folta and Rudinger have adduced evidence to show that there is a certain relationship existing in pancreas-diabetes between the pancreas, adrenals and thyroids.

They assert that it is not the pancreas alone that controls the blood-content of glucose. What, then, is to be said of the con-

clusions of those scientists who persist in attributing to the failure of the pancreas the cause of diabetes and who seem to look upon the glucose factor only as a symptom of the disease and never as its cause?

§ 98—CAN WE IGNORE THIS?

We know now positively that the body is tenacious of its fixed alkaline bases, and on a diet deficient in these bases it cannot long supply the necessary quantity of alkali required to neutralise the organic acids which are daily elaborated in the blood and tissues as a result of the decomposition of proteins, fats and carbohydrates.

On the one hand there is a deficiency of bases in our refined foods and on the other an excess of carbohydrates. No scientist would dare to claim seriously in the presence of these facts that a physiological equilibrium can be maintained permanently on such a broken balance. What would the incomparable Pasteur have said of this?

Glucose, now used in the manufacture of many commercial foods, including nearly all the candies on the market is a mineral-free carbohydrate of artificial origin.

Packard says cancer is due to a diet of mineral-free carbohydrates.

Armand Gautier has demonstrated that the loss of minerals by excretion is offset only by constant intake. Neither glucose nor any other refined food contributes to this intake.

Starling and Foster have demonstrated that animals fed on demineralised or refined food die sooner than if not fed at all. The demineralised canned beef, the extractives of which were all boiled out before canning to make beef extract and canned soup, which caused so much sickness among our troops during the Spanish-American War, is a further illustration of this fact.

Rolf Wilson says mineral starvation is followed by dire consequences.

Takaki, Chamberlain and Vedder have demonstrated that the mineral deficiency of refined food is responsible for high mor-

tality among breast-fed infants. Mother's milk lacks mineral matter in accordance with the mineral deficiency of her food.

Drennin attributes the rapid course of tuberculosis, after pregnancy, to mineral starvation. The fœtus acts as a mineral parasite, robbing the mother's tissues unless her food supplies its needs.

Czerny declares that natural immunity depends on nutrition and that one-sided nutrition with sugars, syrups and candies destroys this immunity in children.

Weigert reports that "tuberculous children succumb more quickly when nourished with sugars and starches. The water content of the organism is inversely proportioned to the natural immunity. Carbohydrates diet increases unnecessarily the amount of water in the tissues and prompts a rapid rise in the body weight.

"Such children, who appear plump, round and well nourished, are water-logged and show slight resisting power against infection." In an earlier chapter we saw this. Now we understand it.

Various investigators have found that demineralised sweets, sugar, glucose, etc., give rise to many disorders. Why do they exclude diabetes from the list of these disorders when the chief symptom of diabetes lies in its rebellion against sugar, particularly its rebellion against glucose?

Charles as far back as 1882 declared: "Temporary glycosuria may be induced by a diet too rich in starch and sugars, and this is more liable to occur with a diminished alkalinity of the blood. Permanent glycosuria constitutes diabetes mellitus."

He says, in other words, that if a temporary glycosuria can be induced by an excessive ingestion of refined starchy or sugary foods and such excess is continued until the temporary glycosuria becomes permanent, the net result of such excess is diabetes.

He also declares that glucose combines with certain acids and bases, as potash and lime, forming glycosates or saccharates, and in alkaline solution has a great tendency to absorb oxygen.

He also makes the significant assertion that in diabetes less oxygen is absorbed than in health.

If glucose is a confiscator of oxygen and if it is observed in diabetes that less oxygen is absorbed than in health, is it not

indeed time that the rôle of glucose as an oxygen pirate be investigated?

The pancreas in health appropriates the salts of lime and potash in the elaboration of its normal alkaline secretions, as is shown in the analyses of these secretions.

What scientist will say that this selective action of the pancreas on these alkaline bases is devoid of significance or that the normal functioning of the pancreas does not depend in any manner upon its ability to make use of them?

Yet, in the presence of the fact that glucose has an affinity for these alkaline bases and combines with them, thereby interfering with their ability to conduct themselves in the tissues and internal secretions in accordance with Nature's laws, who will say that the excessive ingestion of glucose, in strict obedience to its affinity for alkaline bases, does not rob the pancreas of lime and potassium salts by combining with them and carrying them off?

If deprived of lime and potassium in this manner, does not the pancreas suffer an impairment of its ability to assist in the control of the upper limit of the blood content of glucose?

Kleiner and Meltzer of the Rockefeller Institute assume (they use the word assume) that it is the failure of the pancreas to perform its function which causes diabetes.

But what causes that failure?

There is much evidence to support the belief that refined, demineralised starches and sugars, of which glucose is the most conspicuous type, induce this failure, first by weakening the ability of the pancreas to resist the excess glucose assault and, second, by permitting the entrance of glucose into the blood without hindrance after the glucose bombardment has succeeded in breaking down the natural barriers against it.

The experiments of Kleiner and Meltzer, indicating that in health the circulation can utilise only a fixed quantity of glucose —0.1 per cent.—beyond which the healthy or normal pancreas appears to say, "No more shall enter," support the conclusion, although not intended to do so, that it is the excess of glucose and the excess of other refined and demineralised starches and sugars which causes a temporary glycosuria to be superseded by a permanent diabetes, and that the importance which eminent scientists

have heretofore attached to the diseased condition of the pancreas in relationship to diabetes is erroneously given to a striking and significant symptom of the disease instead of to its cause.

§ 99—INFANTILE PARALYSIS

In June, 1916, an epidemic of infantile paralysis broke out in Brooklyn, N. Y.

The disease spread so rapidly that after 187 deaths had been reported in New York City and hundreds of cases discovered in eleven states and Canada, Health Commissioner Haven Emerson announced that he would appeal to the National Red Cross for help.

Three thousand three hundred physicians and nurses were put to work in New York and Brooklyn, and the Health Department informed the public that the United States Public Health Service and the Rockefeller Institute would begin active work at once to assist in stamping out the scourge.

Fifty-five street playgrounds were ordered closed. Every children's reading room in Manhattan and Brooklyn was closed. Sunday schools were closed. Summer camps were broken up. Children not only could not cross the state line but they were not permitted by the police to pass from town to town.

Dr. Lewis C. Ager called for public subscriptions to buy braces and other supporting devices for victims of the disease.

Then came this remarkable statement, July 9th, 1916, from Professor Simon Baruch, who diagnosed the first recorded case of perforating appendicitis successfully operated on, and who is one of the foremost members of the American medical profession:

"For several months I have watched the scientific development of the malign influence of defective or absent vitamines in certain foods, as published in the weekly reports of the United States Public Health Service, together with articles in the medical journals on beri-beri and pellagra.

"Pigeons fed on polished rice are affected by paralysis, technically called polyneuritis, which begins with loss of weight and

ends fatally. Dr. Sidell found that pigeons fed on this exclusive diet did not become paralysed (within the two months of experiment at least) if they were given also some otherwise useless yeast products (rich in mineral salts) from the brewery vats which are usually wasted. He has also shown that if this waste material be given to a pigeon already paralysed it will recover within an hour and to all appearances it will be normal in twelve hours.

"There is a striking similarity in some of the causes predisposing to infantile paralysis and beri-beri. Both occur chiefly in overcrowded localities, in hot weather, and more among males than females. Both are accompanied by fever and paralysis, and both are extremely fatal. Both have prevailed as epidemics, and their fatality has caused terror and despair.

"Beri-beri was formerly regarded as an infectious disease from undiscoverable sources, but is now known to be due chiefly if not solely to absence of vitamines in the diet.

"May not infantile paralysis, which has eluded thus far the most searching investigations, be likewise traceable to some defect in diet that may be discovered?

"We have a clue to the possibilities in this direction in the report of the United States Public Health Service of April 17th, 1916, on bread as food, in which the fact is clearly brought out that the fine roller-milled wheat flour is devoid of vitamines, and that owing to the use of baking powders containing bicarbonate of soda the vitamines in other foods are likely to be destroyed.

"In a study of pellagra in South Carolina, Voeghtlin regards this malady as somewhat related to beri-beri. He found that this disease prevailed in the factory districts, where people eat mostly fat bacon, cereals and soda raised biscuits or corn bread made of highly milled corn, while in the backwoods, where coarsely milled grain is used, pellagra is rare.

"The high cost of vitamine-containing foods, like eggs, milk and meats, makes it impossible for these poor people to protect themselves against the loss of vitamines in purchased cereal foods.

"It may be of interest to ascertain if infantile paralysis has been more prevalent since 1878, when the new milling processes were invented. I omitted to mention as proof of similarity of

causes that the experiments made on pigeons have been confirmed in chicken, which fed on whole corn remain healthy, while the same fowls fed on highly milled cornmeal are affected with paralysis.

"These briefly stated scientific facts lead me to believe that close scrutiny of the food of the children afflicted may lead to the discovery of a dietetic cause of infantile paralysis."

Perhaps it will be found that the diet of the mother before the birth of the infant predisposed it to infantile paralysis.

EIGHT: PREVENTABLE TRAGEDIES OF MILK AND MEAT

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§ 100—MILK

Every boy at the front in 1918 underwent a radical change of habit. There was no easy transition through which to slide gracefully from the comforts of peace into the hardships of war, yet here at home we seek to go on as before, leaving to our sons and brothers the glory of dying for a principle.

We know that milk is a perfect food, the cheapest of all animal foods, and that our money now goes only half as far as it used to go. Notwithstanding this we beheld in 1918 milk stations closing their doors, and farmers sending their cows to the butcher's block because the people did not consume the great flood of milk pouring in from the country at war prices.

The Bankers' Trust Company informs us there are approximately 27,301,199 family groups and wage-earning individuals counted as families in the United States. In 1916, 24,428,000 had annual incomes of $2,000 or less. Millions of families strive to nourish and develop their children on incomes less than $1,000 a year.

Although milk in times of stress is in itself sufficient to save the infant, the findings of the Children's Bureau with reference to Baltimore show that only 29 per cent. of the children between the ages of two and seven years were receiving in 1918 fresh milk to drink as against 60 per cent. in 1917, and that less than 3 per cent. of these children received as much as three cups of milk a day.

H. C. Sherman, Columbia University, has demonstrated that of all the food value of the food consumed by farm animals we recover less than 4 per cent. in beef, the actual figures according to Armsby being 3.5 per cent., whereas 18 per cent. is recovered in the form of milk.

Cooper and Spillman demonstrate that the crops produced per

acre of cultivated farm land will yield but 14 pounds of mutton, 18 pounds of beef, 22 pounds of pork, 27 pounds of poultry and eggs, and 72 pounds of milk estimated on a protein basis.

It is thus seen that a quart of milk is a greater food asset than an amount of meat furnishing the same weight of protein.

Osborne, Mendell, McCollum, Hart and Humphrey have demonstrated the value of those substances found in whole milk which promote growth and perform other important functions in maintaining health.

Back in 1906 Hopkins discovered the fat soluble "A" of cream and the water soluble "B" of skim milk. Seeking further light on the nature of these then unknown substances he withheld publication of the details of his experiments until 1916.

During the same period Osborne and Mendell were demonstrating the same facts. To these facts McCollum and Davis have also contributed.

Milk is not only the most benevolent and useful of man's friends, it is also the most treacherous of his foes. Countless thousands of mothers, were it not for the saving virtues of milk, would be in mourning for their lost infants, and countless thousands of mothers are suffering the anguish that only a mother can understand through the untimely taking off of their little ones, murdered by milk.

The health of the cow and the methods employed in making milk safe have been sadly neglected in America. We know the truth but do not apply it.

Because milk is such a perfect food for the human being, it is also a perfect food for the micro-organisms that spread tuberculosis, diphtheria, septic sore throat, typhoid fever and many other diseases that afflict the human race already devitalised and non-resistant through its morbid consumption of refined starches and sugars.

The United States Government has tabulated 500 epidemics of typhoid fever, scarlet fever and diphtheria caused by milk. These epidemics are but a few of those reported. They merely indicate the enormous extent to which milk, the great life-saver, becomes a destroyer.

Bad milk can be eliminated and good milk, at least safe milk, can be substituted in its place. Under the honest supervision

of any adequately organised health department in small town or city, milk when properly pasteurised is a blessing. When not properly pasteurised it is a curse.

Unlike eggs, meat, poultry and fish, milk cannot be stored in refrigerator warehouses for a year. It cannot be held for speculation. It cannot be refined as wheat, oats, corn, rice, barley, rye and sugar are refined. It brings into the home all the food substances in abundance, except iron alone.

The young animal stores up iron in its liver before its birth sufficient to carry it out of the milk consuming period.

As long ago as 1826 Magenhofen in his laboratory in Frankfort determined the composition of milk, separating the lime, potassium, phosphorus, magnesium, sodium, sulphur, fluorine, silicon, iron, the sugars, fats and casein. All the analyses made since his time have been identical.

The English authority, A. Wynter Blyth, declared in 1909 that Magenhofen's treatise on milk, though little known, contains practically all of what, up to that time, had been established concerning its composition.

The iron of milk is sufficient for the child up to one year of age, but thereafter it requires more iron which unhappily it does not receive from white bread, or sugar.

These milk facts should be remembered, but facts more important than these are about to attack us.

§ 101—MILK AND TUBERCULOSIS

God intended cow's milk for the food of calves to be consumed at the udder. Milk from the clean udder of a healthy cow is practically sterile. The calf's food under normal conditions is not only free from germs, it is fresh.

The child receives cow's milk from twelve to seventy hours old. Good cow's milk depends upon four factors—a healthy cow, a clean cow, plenty of ice and speedy transportation.

If the cow is not healthy the milk is dangerous even when fresh. If the cow itself and the hands of the milker are not clean, or if the milk-can is not sterile, the milk becomes infected at once, even though it be good as it leaves the udder.

If not kept cold the germs multiply by the millions. One drop of milk may contain 40,000,000 bacteria twenty-four hours after milking.

The germs of typhoid fever and diphtheria enter milk through careless or dirty methods of handling. The germs of bovine tuberculosis are introduced through a diseased udder or through small particles of manure which are frequently found infected with virulent tubercle bacilli.

The United States government as well as the governments of Great Britain and Germany have proved the deadliness of bad milk and the meaning of bacteria as an index of its quality. Practical and efficient methods of controlling these dangers have been evolved, but in only a few American cities have they been applied.

If milk were a transparent fluid its luxuriant colonies of bacteria and their accompanying poisons could be seen by the naked eye. Because milk is opalescent the presence of these infant murderers is not suspected. The human eye can easily see a colony but only through the microscope can a single germ be detected.

It is common for milk to reach our large cities containing 150,000,000 bacteria per cubic centimetre. Even these enormous quantities cannot be detected by the naked eye.

Such milk is polluted with B. coli found only in the intestines of warm-blooded animals. Finding their way into milk through particles of manure they rapidly multiply. B. coli in milk means that the milk is filthy.

The most poorly equipped Health Department in America can determine the presence of B. coli in the milk consumed by its children, and through the authority possessed by it can shut such milk out until the dairy farmer substitutes decency for indecency.

Bovine tuberculosis is transmissible to the child not only through milk but through potcheese, ice cream, butter and raw meat, such as the uncooked bolognas common throughout the United States.

Bovine tuberculosis does not necessarily kill; it usually mains or cripples. Its ravages do not manifest themselves at their worst until early adult life.

Bang proved conclusively that virulent tubercle bacilli are

found in milk. Hirschberger found 11 out of 20 specimens of milk from tubercular cows contained tubercle bacilli. Ernst found 42 per cent. of the cows examined by him were giving off tubercle bacilli in the milk, and that the milk of 36 tubercular cows with healthy udders contained tubercle bacilli.

Rabinowitz and Kempner found tubercle bacilli in 71.4 per cent. of the milk examined by them. Prokauer found 55 per cent. of the milk examined by him contained tubercle bacilli. Anderson, United States Public Health Service, found 11 in 104 dairies shipping milk to Washington, D. C., were selling a product containing virulent tubercle bacilli.

Mitchell asserts that milk containing tubercle bacilli is the cause of 90 per cent. of the cases of tubercular cervical lymph nodes in Edinburgh infants and children. Mitchell found 10 per cent. of the enlarged tonsils of children infected with the bovine tubercle bacillus.

Of the school children examined in Berlin by the von Pirquet method, 70 per cent. were found to be infected with tuberculosis of the bovine type, thus revealing the fact that before the war 400,000 in Germany were annually infected through the milk, butter, potcheese and meat of tubercular cows.

Styles found 61 per cent. of the 67 cases of tuberculosis of the joints in children examined by him to be caused by the bovine bacillus, due to infection through milk, butter, ice cream or meat. In all the affected children less than one year old Styles found the bovine bacillus present.

All these children had been fed exclusively on cow's milk.

Fraser, operating upon 70 cases of bone and joint tuberculosis in children under twelve years of age, found 31 cases of the bovine type, showing the diseased cow to be responsible for their misery. Of 25 children brought up exclusively on human milk Fraser found only 6 infected with bovine bacillus, the infection in these cases having come from butter. Of 41 children fed on cow's milk, Fraser found 37 infected with the bovine type and only 4 with the human type.

The British Royal Commission on tuberculosis reports that among fatal cases in children, one-third are found to be due to the bovine type.

Of 500 autopsies performed by Muller on children, the deaths

of 200 cases were attributed to tuberculosis of which an undetermined number was of the bovine type, showing the deadliness of raw milk.

Ravenel, studying 153 cases of tuberculous children from 5 to 16 years of age, found 36 due to bovine infection, whereas out of 280 cases of children under 5 years of age he found 65 due to bovine infection.

The Imperial Bureau of Hygiene reported before the war that 2,700 children died annually in Germany of bovine tuberculosis.

We know now beyond our right to dismiss the facts with a shrug, that bovine tuberculosis does kill our children, and that they have little resistance to the disease because of their enormous consumption of white bread and refined sugars.

Let us see whether or not only a few dairy cows in America are suffering from tuberculosis, or whether the disease is wide spread, so that we may determine the gravity of the raw milk peril.

§ 102—NOT PASTEURISED

Ward reports at least 10 per cent. of the cattle killed in the San Francisco stockyards, coming from open ranges, are tubercular.

Melvin, United States Bureau of Animal Industry, declares that at least 10 per cent. of the dairy cattle of the entire country are tubercular.

Veranus A. Moore, Cornell, found 302 herds in a total of 421 contained tubercular cows. Of 9,633 dairy cows tested by him 3,432, more than a third, were tubercular.

These diseased herds were distributed throughout 39 counties. The tuberculin test is such a reliable index of the presence of the disease that out of 23,869 cows reacting positively to the test, the disease was found in 23,585 when slaughtered, a percentage of nearly 99.

The United States Government publishes a bulletin warning dairymen and cattle growers of the dangers of the disease. That bulletin says: "Among tubercular dairy cows retaining the appearance of health and not known to be affected until tested with

tuberculin, 40 per cent. or more, are actively expelling tubercle bacilli from their bodies in a way dangerous to the health of other animals and persons.

"When tubercle bacilli are present in milk they are especially numerous in butter. The dangers to which public health is exposed through the use of milk from tubercular cows is of a magnitude almost beyond conception.

"The distribution of tubercle bacilli is a commercial systematic distribution from door to door, or rather from table to table. As long as the use of tubercular dairy cows is permitted the manner in which unpasteurised dairy products are at present distributed will insure that practically every member of the human family is exposed to tuberculosis.

"This may explain why 91 per cent. of the bodies of persons who die from various causes show the lesions of tuberculosis."

In spite of these and hundreds of other facts indicating the vast extent to which tuberculosis menaces the consumer of raw milk, raw butter, raw ice cream and raw meat, and the vast extent to which tuberculosis of the bovine type actually ravages the human family, dairymen and cattle dealers openly oppose all efforts of public health authorities to apply the two remedies by which humanity can be protected from these dangers.

They ignore pasteurisation, which destroys all disease germs in milk, and they fight the tuberculin test, although for their own purposes they employ it to cover up the evidences of disease by "plugging" their cows with secret doses in order to mask the symptoms when an official test is made.

§ 103—PLUGGING THE COW

In New York, New Jersey and Illinois the "plugging" of tubercular cows with illegal doses of tuberculin has reached such vast proportions that in a number of instances even honest officials have been rendered powerless through this method of trickery.

Cattle men have discovered that a dose of tuberculin injected into the neck of a tubercular cow is followed by a peculiar phenomenon which scientists call "reaction."

A few hours after the test is applied the tubercular cow suffers a rise in temperature. The fever continues until it reaches its climax, after which it begins to subside, forming the typical reacting curve.

After this reaction the tubercular cow for a period of three or four weeks will not respond to another test unless it be a double dose. During this short period of immunity an official test with a single dose made by a winking veterinarian will fail to disclose the presence of the disease.

Thus the conscienceless owner of a diseased cow "plugs" the animal with a secret dose, waits four or five days, then asks for an official test. A clean bill of health over the signature of a state veterinarian is then issued, and the cow can be sold even to the famous certified herds.

In cases of generalised tuberculosis in which nearly every gland and organ of the cow's body is involved, the animal is so full of toxins of its own manufacture that it either fails to react to the tuberculin test or suffers what is called a delayed reaction.

The so-called official tests terminating at the twenty-fourth hour do not detect the delayed reaction, although such cow is a hundredfold more dangerous. All tests should be continued to the thirty-sixth hour, otherwise they are worthless.

These conditions are not occasional, they are common.

The annual report of the New York State Department of Agriculture, Bureau of Veterinary Service for 1913, of which I have a certified copy, was actually suppressed because of the wide-spread evils it revealed. The politicians were afraid of its publication, fearing the farmer vote.

When the New York City Health Department detects diseased milk it shuts out the dairy farm. This diseased milk is then consumed by people who are not fortunate enough to live in the metropolis.

To emphasise the tragedy of this system, Dr. S. S. Goldwater, Health Commissioner, sent a message February 26th, 1914, to Governor Glynn's Milk Commission. That message which every small town in the United States should study, read as follows:

"Yesterday we discovered another typhoid carrier in one of the milk-producing farms from which the Health Department has traced a number of cases of typhoid fever. The milk of this farm

has now been excluded from the list of milk shippers to New York, but owing to inadequate state control this typhoid-producing milk will now be shipped to the smaller towns which will have to suffer as a result of New York's vigilance. If the smaller towns were under state regulations instead of being allowed to go as they please, these tragic conditions would not be possible."

March 25th, 1914, the New York Milk Committee, numbering among its members many of the most eminent pathologists of the metropolis, issued a public statement declaring that nine out of every ten children suffering from tubercular cervical glands would be sound and healthy as far as tuberculosis is concerned if they had not been fed with the milk of diseased cows.

All but 10 per cent. of the people of New York State drink raw milk, which means that 4,000,000 children are directly exposed to the most dreaded infection that curses the human race.

One-third of the cows of the state are spreading tuberculosis among human infants. A large percentage of the beef sold in the smaller butcher shops in the state consists of the carcasses of dairy animals suffering from tuberculosis at the time of slaughter.

It is through this source of infection that the pitiable conditions of thousands of children under ten years of age, and the fatal illness of scores of adults, are to be traced. Low resistance and constant infection! What an indictment of our intelligence!

The facts were laid before the Senate and Assembly, and cattle dealers immediately gathered at Albany from all parts of the country. The political pressure applied by them disarmed the legislators of the Empire State, and nothing was done.

Before the war politicians subordinated the physical welfare of the children of their constituents to their own political advancement. The boys who went to France to die have at least taught them by another kind of example the hellishness of such philosophy.

The efforts to open the eyes of these politicians were not altogether fruitless. It developed as a result of the agitation that more than two million dollars of the state's money had been wasted by the Department of Agriculture between 1907 and 1914 through indemnities granted to a select list of politically powerful owners of tubercular cows.

It was also shown that these cows after condemnation and slaughter were either installed in State reformatories, hospitals, training schools, orphan asylums, and prisons to infect their inmates, or were slaughtered and their meat sold to butchers.

It was shown that the junior member of a cattle dealing firm had applied to Dr. J. William Fink, state veterinarian, for a tuberculin test of a diseased herd producing milk for consumption in New York City.

Dr. Fink was asked to apply a fake test and give a clean bill of health to the diseased cows in order that they might be shipped across the state line into New Jersey. Dr. Fink refused to make the test, but another state veterinarian succumbed to the temptation and the cows were given a clean bill of health.

An investigation showed that all the cows were grossly diseased. They had to be condemned for fertiliser.

The arrests that followed involved such a large number of New Jersey and New York officials, and disclosed so many similar outrages, that it became necessary to apply a coat of political whitewash to the guilty parties.

There is no such thing as blissful ignorance in the fool's paradise. The fool's children pay too great a price for the folly of their father.

§ 104—THE CERTIFIED HERD

Certified milk is raw milk. Unless such milk be honestly certified it is more dangerous than common milk, because on the assumption of its safety it is fed to delicate infants and invalids, whose powers of resistance are even lower than the low average. We are not discussing the honest certified herd. We are discussing the control of all certified milk.

In spite of the efforts of the Montclair Board of Health, a certified herd, numbering six hundred cows, succeeded in defying the Board for two years because of the dignity of the Medical Milk Commission that stood sponsor for its certified milk, "guaranteed to be free from the germs of the contagious and infectious disease known as bovine tuberculosis."

Finally, October 13th, 1914, after conditions had become so

gross that it was impossible further to withhold knowledge of them from the public, the Essex County Medical Milk Commission, the first commission in America authorised by law to certify milk, was asked to interfere on the ground that the certified herd harbored at least one hundred diseased cows.

The dignified Medical Milk Commission refused to admit that irregularities were possible under its system of supervision, and resisted the invitation to perform its duty.

It was my privilege to expose to the public the wretched farce of this scientific superstition and the complete collapse of the certified milk myth which prior thereto had flourished at the expense of helpless infants.

We invaded the dairy and made a test of its cows. Within a period of two weeks, up to and including October 28th, 1914, two hundred and fifty-four cows were tested. Of these certified cows seventy-nine were found suffering from tuberculosis, yet all of them, up to the very day of their slaughter, were producing "certified" milk for infants and invalids.

Of these condemned cows twenty-four were sold to a Brooklyn slaughter house. I had reason to know that a vast system of Health Department corruption was operating through the graft route in this slaughter house.

I laid the facts before the Government, and for once was successful in inducing the Federal authorities to seize these twenty-four cows in Jersey City on their way through interstate commerce to Brooklyn. They were slaughtered, October 28th, for purposes of post mortem.

The examinations were conducted by Bureau of Animal Industry veterinarians Dr. E. C. Yoder, Dr. Frederick Wilson and Dr. Robert M. Mullins. The witnesses in addition to the writer included Dr. J. E. Smith, president New Jersey Medical Association, Dr. James McDonough, Montclair Board of Health, Dr. Wilbur F. Harrison, Jersey City, Health Officer James Hagan, Jersey City, and Dr. R. C. Newton, president New Jersey State Board of Health.

The Essex County Medical Milk Commission, which had certified to the milk produced by these twenty-four cows, was not represented.

All the cows were found grossly diseased, and under the regu-

lations of the United States Government, the generalised cases were sent to the fertiliser tank.

Certified cow No. 3184, producing certified milk for infants, was typical of the tragedy. She was found to be suffering from tuberculosis of the bronchial glands, tuberculosis of both lungs, tuberculosis of the portal gland, tuberculosis of the mediastinal gland and tuberculosis of the liver.

Following this examination another group of twenty-four cows was seized on its way to the Brooklyn slaughter houses and slaughtered under Government supervision. They were all diseased.

After one hundred and ninety-one cows had been condemned in the certified herd, which had been looked upon as a model throughout the Medical Milk Commissions of the United States, the first Medical Milk Commission established in America passed into the waste heap of rejected rubbish. Eminent academicians who had been forcing certified milk upon the public for years, reluctantly admitted that diseased cows really could produce diseased milk under the shadows of inflated scientific reputations.

The laity had paid the bills, had borne the burden of the mistakes, had suffered the pains of disease.

The sad events which, upon these disclosures, followed each other in dizzy succession, exposed such a condition of complete demoralisation of many of the most famous certified herds of the country, that had the newspapers reported the facts it is quite certain somebody would have gone to jail.

Thanks to the encouragement and support of the three men to whom this book is dedicated, I was able to stick to the scandal out of which subsequently many convictions were obtained, resulting in penitentiary sentences.

§ 105—OLD OFFENDERS

Nineteen certified herds within a period of six months were found to be literally rotten with tuberculosis, and as far as New York City is concerned, a new system of supervision was inaugurated by Dr. S. S. Goldwater.

Following the trail into Iowa, Minnesota, Illinois and Wisconsin, I was able to demonstrate with evidence just as specific and conclusive that the dairy butter and ice cream industries were quite as rotten as the certified milk industry. Both industries required nation-wide reform, of which, at this writing, August 28th, 1918, no indications are visible. The facts are known to the United States Department of Agriculture and the United States Public Health Service, but no official action has been taken.

Justice James C. Cropsey, Supreme Court, Brooklyn, October 4th, 1916, emphasised the horror of these unmolested conditions by sentencing a group of convicted slaughterers to Sing Sing.

Five slaughtering establishments had been operating for twenty-five years in Brooklyn. They specialised in the killing of diseased cows, culled from the dairy herds of the country. These cows, milked as long as they were profitable, were finally, after a career of poisoning the milk, butter and ice cream of the people, salvaged through the peoples' stomachs.

Sixty thousand such cows were killed annually in these five establishments.

By the payment of graft to the extent of $30,000 a year, or 50 cents a head to the officials, the carcasses of the diseased animals were stamped with the official "inspected and passed" seal.

For four years the officials succeeded in resisting my efforts to break up this deadly system. Finally, through the assistance of Commissioner of Accounts, Leonard M. Wallstein, legal evidence was obtained which resulted in the indictment of twelve slaughterers whose establishments, May 26th, 1916, operating as a single unit in a vast system of units, were shut down, thus scattering the diseased dairy culls through the smaller towns and cities of the country.

The wholesale convictions that followed have meant nothing to the officials of other states, and the parade of diseased meat continues. Even the success of Commissioner Wallstein in collecting $1,025 graft money before the trap was sprung that finally bagged the Brooklyn operators, had little or no meaning for other officials, who to-day remain as inactive as they were two years ago.

The packers who have persistently denied the charges made against them by the Federal Trade Commission, 1918, and whose

denials have been given wide publicity by the newspapers carrying their advertisements, cannot hurdle the evidences of their guilt, even though they succeed in fooling the public.

On forty-seven occasions, unarmed with official authority, I have obtained in the last five years forty-seven convictions against Armour & Company, Swift & Company, and Sulzberger & Sons Company (now Wilson & Company). These convictions are all recorded. They resulted in fines of $500 each, the limit permitted under the statute.

The newspapers that have given publicity to their denial of guilt, with the exception of the New York *Globe* and the Chicago *Daily News,* did not publish the details of any of these convictions.

"Old offenders" are sometimes looked upon by the courts gravely and solemnly, but only as a rule when they are commonplace offenders whose crimes are the crimes of human infirmity.

July 5th, 1915, a poor creature pleaded guilty before Justice Petit of Chicago on the charge of stealing two hams, and was sentenced to the penitentiary for life under the "old offender" statute.

"The world will be informed," said Justice Petit in imposing sentence, "that I have sent you to the penitentiary for life for stealing two hams. I have not done that. Your record shows you are a crook, and it is time that the country finds a way to keep habitual offenders like you in jail."

One week later a Federal-inspected establishment, Swift & Company, was convicted in the courts of New York for the sixteenth time within a period of two years, and fined $500 on a charge of trafficking in putrid flesh.

I was responsible for the sixteenth conviction of this offending corporation, and it seemed to me that under the "old offender" act a corporation guilty in the same community of the same crime on sixteen occasions within a period of two years is an old offender.

Justices Russel, Salmon, Kernochen, Moss, Collins, Herrman, McInerny, Zeller, Forker, O'Keefe and Freschi during this short period collected $20,000 in fines from Armour & Company, Swift & Company, and Sulzberger and Sons Company. In only one case did the convicted establishments appeal. In that appeal the

conviction of the lower court was upheld by the Appellate Division, on which sat Justices Ingraham, McLaughlin, Scott, Dowling and Hotchkiss.

In imposing sentence in one of these cases, Justice Russel had perhaps the old offender statute in mind, for he said: "We cannot send a corporation to jail. It is no wonder then that you continue without fear in your assault upon human life and health. When it is considered that this court has the power to send an individual to jail for such an offence as you have committed but can do no more in dealing with the same offence when committed by a corporation than impose a paltry fine which by an establishment doing a business of more than $400,000,000 annually, must be looked upon as inconsequential and without significance, it is not strange that there are agitators abroad who cry out like John the Baptist against these inhuman sins so difficult to detect and so inadequately punished when brought to trial."

These specific instances are recorded here for the reason that in spite of the existence of the "old offender" statute and the evidence of corruption that has flowed in a steady stream from my self-appointed and unofficial investigations, the authorities have persisted in ignoring their duty, while from the milk-producing herds of the country the culls and rejects, the lame and the halt, the diseased and the spreaders of disease continue to pass unmolested into the food supply of the people.

§ 106—AMERICA'S KIDNEYCIDES

The meatless days established, 1918, by the Food Administration were wisely appointed, but the suicidal gluttons of America thought otherwise, and the Food Administration, heeding the clamor, decided it was not necessary to stop the assault and battery tendencies of Americans with respect to their kidneys, and "meatless days" were wiped off the calendar.

Prior to the last week of February, 1918, in America, man's efforts to spare his kidneys constituted patriotism. After that he could beat his kidneys to death with a club, if he wanted to, and still be a patriot.

Sink your canines into as many bloody, bawdy, kindless steaks as you have a mind to! Grind the juicy cadaver between your molars—if you have any molars! Go to a dentist and have yourself equipped with crowns, bridges, or any other device that will enable you to pound to a pulp all the dead flesh your appetite desires! Nothing will now stop you but the price—unless it be your own intelligence.

The man who over-exercises his kidneys, in the performance of which he must under-exercise his brains, will not contribute much to the world's welfare. The converse of this self-evident truth will hold water without leaking.

Homicide is punishable under the State law. Suicide is believed by millions to be punishable under the Divine law. Kidneycide goes scot-free.

All of this may make the angels weep; but incidentally it enabled five packers to pile up net profits of a hundred million dollars a year.

These five packers did not make very much money on a single pound of meat, nor did they prior to 1918 pay a living wage to their employés; but they killed so many animals and sold so much meat that what they called their "turn-over" enabled them to pay dividends of something like forty per cent. on the money invested in their plants. Therefore, unlike the angels, they did not weep while Americans were condemning their kidneys to hari-kari.

Most of the kidneycides of America never heard of Anthony Bassler or the *American Journal of Electro-therapeutics and Radiology*. They do not care much about the comments of Bassler, as published in that journal, upon the significant fact, now conclusively proved, that the human body cannot utilise more than two ounces of protein a day.

Four ounces of beefsteak, roast beef, lamb chops, pork chops, sausage, bologna, chicken, fish or ham contain two ounces of protein.

Therefore Bassler cries out that four ounces of any kind of meat a day should be the extreme limit, even for gluttons, because any quantity of meat in excess of four ounces must be thrown off as waste by the healthy body or stored up as poisons for the kidneys to remove.

Even the boys in their first year in the medical schools know that it is this overload which gradually smashes the kidneys and throws them out of commission.

What is protein? Milk is protein. Eggs are protein. Cheese is protein. Nuts are protein. A very large part of wheat, corn, barley and rye is protein, about one-eighth.

In America, as stated at the hearing before the Committee on Agriculture of the United States Senate in April, 1917, by Secretary Houston, we produced the year before 22,400,000,000 pounds of meat, 7,900,000,000 gallons of milk, 1,847,000,000 dozens of eggs, 567,000,000 fowls; and so many billion pounds of cereal protein that there aren't sufficient ciphers left in the linotype machine to tell the story here.

The story wouldn't mean anything, anyhow, if it hadn't been for the testimony before the same Committee of Dr. Clyde L. King, Assistant Professor of Political Science at the University of Pennsylvania. Dr. King showed that in the United States we consume daily 80 grams, or nearly 3 ounces, of protein, whereas even in Germany, whose inhabitants were all fed up before the war, only 61 grams were consumed. The figures for France before the war were 44 grams; for Japan, 14 grams; for Austria, 27 grams; for Russia, 26 grams; for Italy, 52 grams.

The statements made here are not sweeping statements. They have gone to headquarters for their authority and are fool-proof.

All of which means that Americans in consuming eighty grams of protein daily are attempting the impossible. We are attempting to dispose of about thirty-five grams more than we have capacity for. Our kidneys cannot talk. They just have to stay mum until a hundred and one bodily disorders start us looking around for some mysterious cause of serious trouble. Then, as a rule, it is too late to apologise to the kidneys.

The plain facts recorded here might have some consolation in them if they really told the whole story; but they do nothing of the kind. Babies, old people, sick people, children under ten or fifteen years of age, and the very poor—who are becoming more numerous in America—do not consume the daily average of eighty grams of protein.

To keep the average up to this high level, the kidneycides have to eat not only their own share and the vast excess representing

the difference between their own share and what they ought to eat, but also the left-overs which the babies, old people, and the others cannot eat and do not eat. This hoists the total for millions of kidneycides far above the eighty-gram mark and it is quite evident that there are many millions of kidneycides in America who consume one hundred grams and not a few who consume one hundred and fifty grams.

No; such people are not patriots. They do not help win war. They are the kidneyviki of America, and if it were not for the fact that the chaos over which they exercise control is the product of gross ignorance, I would subscribe to the proposition that they ought to be taken out, shot, and converted into fertiliser with which to enrich the wheat fields, orchards and vineyards of the Nation.

These kidneyviki, who ought to know that they cannot consume more than four ounces of meat, including poultry, cheese, and eggs, daily, without injuring themselves, ought to know also that in Europe there is very much less than four ounces of meat a day to consume. Why, then, should they complain of meatless days? They can well afford, with benefit to themselves, to do without meat on meatless days in order that from their savings they may supply at least part of the needs of America's friends.

§ 107—MEATOLOGY

The failure of meat to supply the needs of the body can be understood from the fact that it is easy to bring about in young dogs a condition resembling "rickets" in children by feeding the dogs on meats and fats alone. If pulverised bone is added to their diet the young dogs recover quickly.

I do not for a moment agree with those who claim that there is no place whatever for animal flesh in the diet of man. It is well known that there are times when a meat diet is valuable, provided the meat is cut from the carcass of a healthy animal and none of its extractives are lost in cooking. Yet we should remember that catarrh, rheumatism, blood diseases, and many other physical disorders cannot be cured where meat is con-

sumed in excess. Meat is one of the pegs in our national shoe.

When we eat the flesh of an animal we eat the end-products of the animal's life processes: urea, uric acid, the animal sweat, dead cells, toxic waste, etc. When we eat whole grains, legumes and milk, the nitrogen supply is just as great, even greater, without the urea and the other poisons.

In comparing the merits of a heavy flesh diet with a diet of whole grains, eggs and milk, we stumble into another point of tremendous interest. For every pound of beef consumed by man, ten pounds of corn are necessary to produce that pound of beef. A pound of beef will partly support a man for a given length of time; but the same quantity of corn necessary to yield that pound of beef will support ten men for the same length of time.

Leibig, as we have already seen, cites the restlessness and incessant activity of meat-eating animals—lions, tigers, panthers, wolves, hyenas—and observes that men who habitually cram themselves with meat manifest similar irritability and lack of repose.

This condition of high pressure in the vital processes is merely functional excitement—not true invigoration. To be whipped into stimulation is not to be strengthened or recreated. Let us not forget that the meat-eating animals pace up and down with a certain wildness of movement, while the elephant, camel and horse exhibit all the dignity of reposeful strength.

When man attempts to live on an excess of meat and is forced to neutralise the waste products produced by meat digestion and in addition is also forced to neutralise the waste products continually generating in his own body, thereby imposing upon his organs of elimination a double task, he is at the same time attempting to sustain himself with imperfect foods. Then he complains of constipation, biliousness, headache and albumen.

We know that a meat diet tends to acidify the blood and that man's only defence against the attacks of disease is based upon the normal alkalinity of the blood. A. E. Wolff has analysed the flesh of beef, veal, and mutton to determine the average of alkalines and acids in one hundred parts of such flesh. Commenting on Wolff's findings, Armond Gautier states:

"In the ash of muscle, phosphoric acid is united to the extent

of two-thirds to the potassium of the tissues. The other third, not finding sufficient alkalinity to neutralise it, remains mostly acid. The sulphuric acid found in the tissues comes from the sulphur of the albuminoids. The destruction of meat in the body thus tends to acidify the blood both by mineral acids and organic acids, which originate from the digestion and decomposition of meat.

To render these acids harmless they must be neutralised in the body.

In a meat and vegetable diet the vegetables furnish the alkalines necessary to neutralise these acids.

Meat eaters should therefore always supplement their diet with plenty of fresh vegetables and should see to it that none of the alkaline juices of the vegetables are lost in cooking.

But, in order to neutralise with vegetables the acids of meat, the kidneycide who eats twice as much meat as he ought to, would have to eat twice as many vegetables as he can hold. Thus far no surgeon has been able successfully to devise an operation that would enlarge the stomach to any such capacity.

It is much easier to develop an enlarged cranium than to dilate a stomach ordinarily designed to hold a quart to a degree that will enable it to receive a peck. There is no questioning the fact that if we are going to go on in America with our present rate of meat consumption, we have simply got to get new stomachs.

It might be possible at birth by a deft operation to substitute a calf's stomach for the human stomach in order to enlarge the human capacity, but to do so it would also be necessary to equip the body with a liver and two kidneys that would measure up in size to the increased demands made upon them. This would necessitate the extension of the entire abdominal cavity—a difficulty that might be overcome by grafting over the abdominal surface of the infant fifteen or twenty square feet of cowhide.

To support this rotund sack we might rig up some kind of a block and tackle which would enable the child as it grows to waddle along into adult life.

The prospect is not promising, but it seems to be the only way out of our present difficulty.

In the meantime the meat eater ought to consider certain facts which have no bearing on patriotism but which affect his

own physical welfare to an extent rarely suspected by him.

Wet, water-logged, soggy, soft, gelatinous, flabby meat is always of poor quality as distinguished from good meat which has a healthy red colour, unless it be pork or veal, the colour of which is pale.

To the touch good meat should be firm and elastic; not wet, but moist.

Meat of a pale pinkish or bluish hue should be rejected as coming from diseased animals. Meat which has a deep purplish colour should also be rejected, for this colour indicates that the animal died a natural death—that it was not slaughtered.

Meat which has a blazing red colour, instead of a dark, rich but dull red, has been treated with anhydrous sodium sulphite. Hamburg steak is the most abused in this regard.

Tubercular meat is especially to be rejected. Animals suffering from tuberculosis do not always leave in their flesh symptoms which can be detected by mere visual examination, although the marks appearing in the advanced stages of tuberculosis are unmistakable.

Meat which discharges its juice on the platter in large quantities is frozen meat which has been thawed. Freshly killed or merely chilled meat is comparatively dry.

In freezing meat for storage purposes the liquid constituents of the tissue cells expand just as water expands. The expansion ruptures the cell walls just as it ruptures a lead pipe. When the meat is thawed for sale by the retailer the cell juices flow through the broken tissues and escape. Frozen meat after thawing putrifies rapidly.

No meat should be consumed raw for the reason that it may not only infect its consumer with tuberculosis but also with trichinosis and other diseases.

The heat ordinarily applied to a heavy roast does not sterilise the lymphatic glands which lie imbedded in the flesh. If the animal is tubercular the glands are always affected even though no evidence of the disease is to be found in the tissues.

In milk the germ of tuberculosis is killed when heated to 145 degrees Fahrenheit for thirty minutes. This is called pasteurisation.

Meat, however, is a poor conductor of heat, and heat pene-

trates to the centre of large pieces of meat very slowly.

If the interior of a roast of beef retains much of the blood-red colour of the raw meat you can be sure that the temperature has not been high enough to destroy any germs that may be present.

Dr. Woodland of the British Royal Commission subjected meats known to contain tubercular material to the ordinary processes of cooking. After cooking he used the central portions for feeding and inoculating animals. The results were startling.

He found the centre of a joint weighing six pounds never attained a higher temperature than 140 degrees Fahrenheit during ordinary cooking. The germs on the outside were destroyed, but those on the inside remained alive.

The results of his experiment prove that the most trustworthy method of cooking meat is by boiling.

Mutton is probably more easily digested than beef because its fibres are much finer, and its connective tissues loose. Veal is thought to be difficult to digest, although its connective tissues are very loose and are readily converted into gelatine.

In explanation of the belief that veal resists digestion it is said that the fibres of veal easily escape the action of the teeth and that because its flavour is insipid as compared to the flavour of other meats it fails to stimulate a liberal flow of the digestive juices.

Pork is digested with great difficulty on account of its high fat content. It requires a much longer time to digest fat than to digest muscle fibre. Bacon is an exception to this rule as it can often be consumed without any ill effects by those who find difficulty in digesting other forms of fat.

The breast of chicken and game is digested with more ease than any other form of meat.

Lamb is probably the most wholesome of all meat foods for the reason that the sheep is found to be amazingly free of the diseases which affect such a large proportion of the steers and swine offered for slaughter.

Beef tea is made by boiling the flesh of old cows, known in the packing industry as "canners" or "downers."

The boiling extracts the soluble substances present in the tissues. The cast off cells of the old flesh and the waste products

of its muscles are soluble in water, consequently they enter the extract.

The insoluble waste which appears in solid form becomes "corned or canned roast beef."

For myself I find that carefully selected meats do not harm me when consumed in moderation. Three or four times a week I eat meat. When I used to eat it three times a day I did not know what was the matter with my health, but now there is nothing the matter with it.

§ 108—OLD WHEN TIRED

When we are tired we are old. Age might well be said to be a state of chronic fatigue. Even the very young suffer from fatigue and it is usually during fatigue, when the vitality is at low ebb and resistance weak, that the germs of disease begin their growth in the body.

Youth suffers two kinds of fatigue—nervous fatigue and muscular fatigue. In either case the conditions may be brought about by overexertion or disease. The scientists call the former physiological fatigue and the latter pathological fatigue. These two forms of fatigue differ from one another only in degree.

The sensations of fatigue, with all they signify, are of interest to a nation confronted by food problems because it has been established that certain kinds of food will produce the same chemical changes in the human tissues that are brought about by fatigue.

Fatigue interferes with the activities of every gland of the body. Its principal effect is to destroy the capacity of muscle and nerve to perform the work natural to them. Its chief symptom is depression, and its chief effect the destruction of all those natural forces which tend to protect the body from disease.

Because fatigue is so intimately related to food folly as well as to overexertion and disease its dangers should be clearly understood.

Dr. Arthur L. Fisk has devoted many years to the study of fatigue, examining its phenomena through the tired muscle.

He informs us that, inasmuch as the muscles are more accessible for investigation and experiment than are the nerves, we necessarily know more of the fatigue of the muscle than of the nerves.

"But," he says, "as the general law of biology applies to both muscle and nerve alike the processes which take place in the one doubtless occur similarly in the other."

Until recently the fatigue of muscle which results from physical exertion was thought to be a condition only of the muscle, but this is now known not to be the case.

If a healthy fresh muscle of a frog's leg is placed upon a marble slab and stimulated with electricity it will contract in the same manner as it would have done in life and health.

If these contractions are repeated in sufficiently rapid succession certain chemical changes take place within the muscle tissue. During these changes there are formed in the tissues some of the same toxic substances which are formed in a one-sided diet of refined food. These substances are lactic acid, creatine, and carbon dioxide. An exclusive diet of white bread, meat and sugar produces the same tissue change as is produced in fatigue.

When these substances are developed in the muscle of the frog's leg it resists further contraction and can then be said to be in a state of fatigue. However, if these toxic substances are removed by flushing the tissues with a weak salt solution the muscle of the frog's leg will again contract when the electrical stimulus is applied.

All these toxic products of fatigue are acid. During rest following fatigue these acids are neutralised by the alkalines of the blood and internal secretions, after which the muscle is restored to a state of freshness, strength and tone.

If these corrective alkaline substances are removed by mechanical processes from food before it is consumed the blood and other internal secretions which the body relies upon in health to counteract the poisonous effects of fatigue must necessarily be deprived of the tools with which they operate.

Even an amateur can readily appreciate the fact that to the extent to which food refinement robs the daily diet of these corrective alkaline salts the body is correspondingly handicapped

in its effort to overcome the evil effects of fatigue, from which complete receovery on a refined diet is absolutely impossible.

§ 109—FOOD AND FATIGUE

To clearly understand the direct relationship between food and fatigue it will be well to examine the remarkable experiments of Weichardt, Ranke, Mosso and Lee.

Weichardt took living animals which had been fatigued by their own exertions, cut from them pieces of muscle tissue, and recovered from this tissue poisons which could not be recovered from healthy tissue in a state of rest.

These poisons, taken from the fatigued muscle, were injected into the body of the rested animal, which soon after began to manifest all the symptoms of natural fatigue.

This experiment proved that fatigue is produced by chemical changes of an acid character which take place in the tissues and that until these depressing acids are neutralised by the natural functions of a healthy body the poisons remain in the tissues.

Ranke, convinced that the products, lactic acid, creatine, and carbon dioxide, developed by muscle activity, were responsible for the phenomenon of fatigue, experimented on frogs' muscles, into which he introduced these substances taken from the laboratory.

He found, after injecting creatine and carbon dioxide into the muscle, that it lost its strength as well as its power to move.

After proving this he gave the name of "fatigue substances" to creatine and carbon dioxide.

Mosso, as a result of his study of fatigue, found it was due entirely to chemical changes within the muscle.

Lee describes changes which he says result in the production of three acid substances which he calls sarcolactic acid, novopotassium phosphate, and carbon dioxide.

All of these substances are acid in their reaction, which accounts for the acid reaction of a muscle in a condition of fatigue as distinguished from the reaction of a muscle in repose, which is alkaline.

Until these acid products of fatigue are neutralised by the alkalinity of the healthy blood which passes through the tissues the fatigued muscle cannot recover its strength.

The fact that the alkaline salts are removed from most of the foods served on the American dinner table has never been heeded by the medical profession as a body, although individual physicians in many parts of the country have in recent years recognised the truth and are applying it in their practice by prescribing unrefined foods in many diseases.

Fisk declares: "Fatigue is the result of chemical changes which occur within the tissues and organs of the body and which give rise to certain toxic products that act to depress these tissues or organs.

"Nerve tissue is no exception to the general biological law. Such changes occur in the nerves during activity as well as in the muscle tissue.

"Intense mental activity is capable of giving rise within the body to these profound chemical changes as shown by the frequent occurrence of a nursing mother suffering an intense fright and, subsequent to it, nursing her baby, who within three or four hours thereafter has severe convulsions.

"This also demonstrates," he says, "that the action of the fatigue poisons is not confined to the tissues in which they arise, but passes over to all the other glands and organs of the body affecting their secretions and functions.

"The constitution of the blood is altered by the absorption of these acid products of fatigue, in consequence of which its alkalinity is greatly diminished, a condition which results in serious disorders.

"Any activity on the part of a nerve or muscle that is already in a condition of fatigue results in decidedly more harm than would a heavier task done under normal conditions, so that when the body is fatigued even a small amount of extra work often produces disastrous results."

The athlete generally recognises the importance of food of the proper kind in order to enable him to recover from the fatigue of his exertions. He instinctively recognises that if he can get his blood in a healthy condition through proper dieting he will more quickly overcome the depressing effects of fatigue

and thus recuperate under strain in a more rapid manner.

Without knowing why, he understands fully that if he can bring about in his blood a perfectly normal alkaline condition it will have capacity for neutralising larger quantities of the acids of fatigue, thus contributing to his endurance and enabling him to outlast his opponent in a contest.

The conditioning of all boxers and athletes is based upon the training table.

Growing children, prospective mothers, nursing mothers, and bread-winners engaged in the ordinary exhausting pursuits of the day are just as dependent upon the application of these biological facts to their own physical welfare as is the boxer, but the importance of food is not recognised in the ordinary everyday walks of life.

§ 110—THE END OF FATIGUE

Extreme fatigue, whether nervous or physical, produces a change in temper, causing irritability, and often overpowers the noblest qualities.

There is scarcely a man, woman or child who does not daily suffer some manifestation of irritability which, if properly understood, might be traced to its proper source and overcome.

Impoverished food, through diminishing the alkalinity of the blood and thus reducing the capacity of that fluid to neutralise the poisonous acids of fatigue, has done much to upset the happiness of the human family.

Incompatibility of temper is dragged into the divorce courts more often through the impoverished food route than through any other channel.

The fretful, irritable child which occasions so much vexation and anxiety at home is the victim of much preventable suffering only because it is reacting to the ignorance of those who have undertaken to supply its tissues with food incapable of contributing to their normal needs.

Many a highly developed mind breaks down in the midst of its unfinished labours solely because with all its intelligence it

still acts in the dark as regards the physical needs of the body which sustains it.

The worn down business man crams himself with foods which no owner of a prize animal would permit in his kennel, stable, or stock farm.

Fisk enumerates the order in which the functions of the body are affected in fatigue. He says, "We first find the circulation and respiration affected, then later digestion and then the action of the kidneys. In individuals of advanced years we have to deal with tissues in a condition of fatigue or depression due to the wear and tear which they have suffered during the stress of life in years that have passed.

"The evidence of this fatigue is shown by what is usually called lowered vitality exhibited in poor circulation, deficient respiration, impaired digestion, and faulty action of the kidneys—processes which have to do with oxidation, assimilation, and elimination. Such individuals are in a condition of chronic fatigue, depression, or acidosis."

This word "acidosis" persists throughout the literature of impoverished foods. The sailors who were stricken aboard the converted cruiser *Kronprinz Wilhelm* suffered from a condition of acidosis so similar to that of chronic fatigue that the symptoms of both were identical.

In their case an abundance of acid-producing foods so diminished the alkalinity of their blood that their tissues were saturated with the acids of fatigue. They lost the power of locomotion. Their blood had been robbed of alkalines to such a degree that even the slight scratches upon their hands and feet refused to heal.

Alkaline solutions quickly enabled them to neutralise these acid poisons and they promptly recovered.

Describing the effects of fatigue upon the aged, Fisk says: "They increase the depression of acidosis of the tissues that exists and this increase overpowers the system with poisons so that death results."

Foods which produce an acid reaction in the body must be consumed with foods which produce an alkaline reaction.

Foods robbed of their alkaline salts cannot contribute this alkalinity to the blood.

Blood robbed of its natural alkalinity cannot neutralise or correct the acid products of fatigue.

The tissue sweeteners are the alkaline salts found in ripe fruits, succulent vegetables and greens, milk, egg yolk, beans, peas, lentils, whole wheat, whole corn, and other whole cereals.

NINE: WHAT THE WORLD SHOULD KNOW OF THE MYSTERIES OF FOOD

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§ 111—IRON AND THE RAISIN

The skin of anemic women is white. The flesh of anemic women is flabby. The muscles of anemic women lack tone. When iron is withdrawn from their blood the roses vanish from their cheeks. Cosmetics applied from the outside deceive neither God nor man.

Iron deficiency as a disease baffles the medical profession. There are no whoops of joy, no outbursts of buoyant energy, no cries of bounding gladness, no hops, skips or jumps, no fountains of eternal youth, vigour, life or health in the bottle of "beef, iron and wine," or the jar of rouge.

Tired and listless folk, with energising iron clamouring for recognition, fail to see it at their doors.

Among the most prolific sources of food iron, the raisin is conspicuous. California might well be called the "Iron State" though never has she been so honored. Her fruity little nuggets of iron are gathered from bounteous harvests only to be ignored by white-faced creatures, who mournfully cry, "Where are the iron men of yesterday?"

The raisin, heavy with iron in its most assimilable form, begs mankind to let it do for the weak and the weary the things it was created for.

Polar explorers with indomitable courage face the longest nights of the Arctic winter when iron props their strength. When the prop falls they yield tribute to misery and death, attended by anemia, scurvy and mineral starvation.

No wonder the adventurer who pushes into the North places the raisin on the pinnacle of glory nature made for it.

Lelensky fed dogs upon foods deprived of iron. Dogs can live on any food that will sustain a human being. In one dog thus fed on an ironless diet the percentage of the red colouring

matter of its blood fell in nine days from 18.5 to 13.1; in another dog fed the same way the percentage dropped in six days from 14.8 to 11.3. Anemia became more pronounced as the ironless diet was continued.

California with her vast crop of raisins should know that the iron demanded by the body for oxidation, secretion, reproduction and growth must be obtained from food iron not from medicinal iron.

Because it contains an abundance of iron the raisin might well be chewed as gum or tobacco is chewed. It might well become a part of all our breadstuffs, cakes and muffins. It might well go with us into the hospital and the nursery.

Soaked in water overnight and simmered gently for a few minutes in the morning, the raisin makes an ideal and easily digestible breakfast fruit.

Like whole cereals it contains the mineral salts essential to life. Not only does it provide iron in abundance, but it yields in large measure lime, magnesium, potassium and phosphorus.

The raisin is a gift of God. Every athlete, every mother, every child, should cultivate the raisin habit.

If we could increase the consumption of raisins a hundredfold, much of the anemia due to our denatured foods would disappear.

Come, California, give us raisins and more raisins, so that in the days of peace we may find argosies of iron-laden dried grapes ploughing their way over courses whose mistresses too long were iron ships of war.

§ 112—CORNELL'S O.K.

Some little confirmation of the truths outlined here breaks forth occasionally in wholly unexpected fashion.

In April, 1917, the New York State College of Agriculture, Cornell University, issued a bulletin urging the people to consume generous quantities of milk, eggs, dried and fresh fruits, peas, beans, succulent vegetables, whole wheat, whole corn and whole rice in order to obtain the minerals necessary to health.

"Green vegetables contain great quantities of iron, and iron,"

continued the bulletin, "enters into the composition of the cell nucleus and of that part of the red corpuscle which carries oxygen.

"Iron is important for growth and for maintaining the blood in good condition. Children, young girls and women, expectant mothers especially, need a diet rich in iron."

After outlining the necessity of iron, lime, phosphorus, potassium, magnesium, sodium and other food minerals, the bulletin declared: "It is advisable to include in the daily dietary a certain amount of cellulose frequently called indigestible plant fibre or roughage."

Here, at last, is university recognition of facts in the denial of which the food poisoners of America are more menacing from within than was the Kaiser from without.

Every day since 1911 the New York *Globe* persevered in spreading this gospel, and every day until the Cornell bulletin appeared it was laughed at, as it has been laughed at ever since.

§ 113—POTATOES, PARSNIPS, CARROTS, AND TURNIPS

Among the best of the foods symbolic of mineral richness, is the humble potato. The United States has never made full use of this naturally alkaline food. Our methods of preparing it have squandered its most desirable dietetic substance.

Because the potato has been plentiful and comparatively cheap we have looked upon it as unimportant, yet Armand Gautier himself has no hesitancy in declaring that the potato, in addition to whole-grain bread and meat, is the most general and valuable aliment. Since it has become popular, famine has disappeared from Europe.

The small new potato differs little in composition from the fully developed potato. Because of its great richness in potassium, calcium, and magnesium, it does not acidify the blood as other starchy foods, but rather alkalises it.

When peeled and cooked in water it loses most of these mineral salts, which pass into the water and are not served at the table. Steamed in its skin the potato retains its full flavour,

also its salts. Baked in its jacket it is ideal, provided the skin has been carefully washed and brushed before baking. Even the crisp skin when masticated will agree with nearly everybody—man, woman and child.

Growing children and expectant mothers should not eat fried potatoes, nor should any adult in delicate health.

Next to the potato in value as regards their alkaline influence on the blood, the carrot, turnip and parsnip are paramount.

Tender, new carrots, steamed and served with butter sauce, cream sauce made of milk powder and their own juice, are not as popular in America as they should be.

Turnips, steamed, mashed and seasoned, are likewise lacking in popularity.

Parsnips lack the general recognition which their virtues merit. In the old-fashioned home these tubers are employed in soup making, thus contributing their alkalising juices to the dietary. They yield calcium in quantity almost as great as that afforded by the potato.

The parsnip contains nearly twice as much calcium as the potato and in potassium salts is richer than carrot, turnip or potato. The parsnip also contains more phosphorus but less iron. The carrot and turnip contain less than half the iron found in the potato.

A judicious combination of these tubers will bring to the dinner table such varying percentages of these alkaline salts that in the long run the general average of the combination might be said to be ideal.

In proportion to cost the fruits and vegetables furnish much more iron than meat and fish.

Sherman reports the cost of meat and fish is about 35 per cent. of the total expenditure for food and the cost of vegetables and fruits only 18 per cent., although the food iron of the vegetables is incomparably superior to the mere traces of iron found in meat.

Meat tends toward excessive intestinal putrefaction with resulting absorption of poisons detrimental to the red blood cells and interfering with the economy of iron in the body. Fruits and vegetables on the other hand have the opposite effect, and

their use in liberal quantities tends to prevent intestinal putrefaction.

Herter shows that among anemic people the anemia is closely associated with intestinal putrefaction, and that an improved condition of the blood quickly follows upon the larger use of fruits and vegetables.

He observes that anemia is much more common among meat-eating animals than among herbivorous animals. Not only are the salts contributed by the carrot, parsnip, turnip and potato of great aid in bringing up the blood to normal, thus fortifying the tissues against disease, but because of their bulky residue they produce a mild laxative effect which prevents the absorption of putrefactive poisons in the intestines.

In ancient times the carrot and turnip were held in great esteem, and it is difficult to understand the reason for America's indifference to them.

The Greeks and Romans boiled the carrot in a stew pan over a slow fire with cummin and a little oil, sprinkling the finished dish with ground cumminseeds before serving.

The epicurians of Athens prepared turnips by boiling them, adding cummin, mashing in a mortar, then adding honey, grape vinegar, gravy, stewed grapes and a little oil. The whole was left to simmer and then served.

The extensive cultivation of vacant lots, home gardens and truck gardens stimulated in America by the war, should never again be discontinued. We should eat more cabbage, spinach, lettuce, onions, leeks, radishes, parsley and cucumbers, except in the rare cases where the individual presents an idiosyncrasy against them.

All these greens afford large percentages of potassium. The presence of potash (potassium carbonate) in the ashes of burned wood accounts for the fact that wood ashes are alkaline. It is for this reason they are used in sweetening sour or acid soil.

The potassium salts of these green vegetables have the same effect exactly on the tissues of the body, keeping them sweet and alkaline.

The eating of these vegetables actually diminishes the acidity of the urine, a fact demonstrated by Blatherwick, who found in all his experiments with vegetables that the urinary acidity

is diminished as expected, showing that the alkalinity of vegetable foods is actually utilised in neutralising the acids of the body.

On this point Sherman is most explicit and emphatic. "It should be clearly understood," he says, "that an excess of base-forming elements in the food is not in any sense objectionable, since the oxidation processes in the body are constantly yielding such large quantities of carbonic acid that any surplus of base-forming elements goes to form bicarbonates which not only do not disturb the neutrality, but which act as a reserve material for its maintenance."

It is obvious as all experiments attest that the greater the amount of meat, fish, eggs, sugar and starch consumed, the more important is a liberal supply of fruits and vegetables. As meat eaters we have run mad. Our vegetable appetite is far below normal. This lack of balance, even without white bread to contribute to it, is menacing the stamina of America.

§ 114—FRUIT

When the Creator placed man in the garden of Eden, He commanded him to eat of the fruit it contained.

From that time fruit has been mentioned incessantly in the history of nations.

The American farmer frequently complains that he cannot obtain the cost of picking his fruit, nor the cost of a basket or crate in which to ship it to market.

I have attended many legislative hearings in which these grievances have been aired.

Fruit trees have been chopped down, the stumps removed, and the whole orchard given up to the cultivation of other crops because the people of the cities eat fruit so slowly that little room is made for new shipments, which must be sold for a song or allowed to rot on the ground.

The United States produces an abundance of fruits of every kind, yet so strangely have the American people been weaned from their fruit appetites that they consume perhaps one-fifth

of the total annual harvest. For this reason they pay fancy prices for such fruits as they do eat.

If their fruit appetites were normal they would secure great quantities of fruit at much cheaper prices, and the fruit farmer who now barely ekes out a living from his labors, would be prosperous and happy.

We know how Moses exempted from military service any one who had planted a vineyard, and how all fruit trees conferred the same privilege upon their owners.

The heathen nations understood the importance of fruits. To make them sacred and thus augment their popularity, they invented gods and goddesses to look after them, such as Pomona, Vertumnus, Priapus.

The sole care of these deities was to protect orchards from bad weather, insects and robbers.

The fruit of the olive tree grew under the protection of Minerva; the date was consigned to the protection of the Muses; the fig and grape were looked after by Bacchus.

So greatly did the heathens venerate these two fruits that they elevated Bacchus to the level of their other gods.

We have here an instance of a god receiving a promotion through the human appetite for figs and grapes.

The Greeks always served two courses of fruits. The Romans always ate fruit for breakfast. The third course of their principal meal consisted of an incredible profusion of the production of their own orchards.

Rich patricians planted fruit trees on the summits of high towers, and on their house tops, thus dwelling always, as they thought, under the orchards and the protection of the god watching over them.

From Rome the modern method of canning California fruits in a thin sugar syrup was borrowed. The Romans immersed their fruit in honey for future use. In those days bees were cultivated with great care, and the Romans not only enjoyed the fruits of the orchard, but also the nectar of its blossoms.

In all experiments conducted with gorillas, chimpanzees and other members of the monkey tribe, it has been found that these creatures thrive best on a fruit diet. The reason for this is not difficult to find, although certain groups of scientists have tried

to prove that their own meat-eating grandparents descended from the fruit and vegetable-eating primates.

The luscious flavour and tempting bouquet of ripe fruits stimulate appetite and excite the flow of gastric juices. Fruit juice is medicine. Fruit pulp is food.

No pharmacist has ever compounded a nostrum which bears in curative properties the slightest resemblance to pure fruit juice.

Perhaps if the fruit farmers of the United States were to organise themselves into an educational association, and by taxing their fruits a cent a basket, create a fund for the purpose of advertising the truth concerning the medicinal virtues of ripe fruit, they would no longer have occasion to complain of bad markets. Fruit juice has no calorie value. It is just good.

The appetite for fruit is a natural one, and needs only to be restored. The coarser and grosser flavours of charred meats and heavy gravies have blunted the fine organs of taste, but down in the heart of man is an instinctive appreciation of the products of vine and tree which can never be entirely destroyed.

Upon this foundation there can be built to the benefit of the people of America an edifice devoted to the improvement of public health by way of the dissemination of fruit truth.

At the root of such truth lie the results of the work of Blunt, University of Chicago, and Otis, College of Emporia, Kansas.

These laboratory workers were shocked to find that dietitians invariably compute the quantity of iron in the cooked food prescribed for their patients on the published percentages of iron in the raw food. All these published percentages of mineral salts in foodstuffs are determined from analyses of the raw product.

Blunt and Otis, knowing that the soluble salts are lost in cooking, also knew that such loss would deprive the patient of a large quantity of the very elements for which the dietitians prescribed certain foods.

Selecting iron as the subject for their tests, they found the average loss in boiling in the usual way for spinach was 43 per cent., for string beans 39 per cent., for navy beans 32 per cent., for peas 36 per cent., for potatoes 15 per cent. As this loss

represented soluble iron it is probable that the remaining salt is not nearly so available for the uses of the body.

The other salts are lost to a similar degree, hence all vegetables which are boiled before serving, unless their juices are consumed as soup, make it necessary to consume more fruit, the juices of which are not usually poured down the waste pipe.

§ 115—SULPHUROUS ACID

With the exception of prunes, currants and raisins, practically all dried fruit in America is outraged by treatment with sulphurous acid. Even the Sultana or blond raisin is bleached. The dried apricot, dried apple, dried peach, dried pear, and the fancy dates and figs are bleached. Dried mushrooms, maraschino cherries, English walnuts and almonds are likewise subjected to the fumes of burning sulphur.

New Orleans and Porto Rico molasses, no longer worthy of the name they bear, are doped with this chemical. White wines contain enormous quantities of sulphurous acid, the spiteful, biting, acrid flavour of which is dominant once the consumer's attention is drawn to it.

Crystallised ginger root and candied fruit peels are treated in the same manner.

The enormous extent to which sulphurous acid and its salts are employed is not dreamed of by the plain people.

For years the Bureau of Chemistry, Department of Agriculture, at Washington, and the dried fruit industry have fought each other to such lengths that scientists and lawyers engaged by both sides in a controversy the public has never heard of, have appeared in almost all the courts of the country for and against the sulphurous acid abuse.

All efforts to reform the methods of preparation whereby brunette fruits are forced to appear under a blond exterior have been defeated by the food sophisticators.

For eight years the Referee Board to whose hands the sulphurous acid problem was referred for a decision, kept quiet while

in the meantime the harvest of sulphured fruits increased enormously.

In 1909 California alone produced 40,000,000 pounds of dried peaches, bleached with sulphurous acid. In 1914 this quantity had increased to 64,000,000 pounds. Eight years is a long time in which to determine whether a poison is a poison, while the public during the interim without its knowledge, goes on eating the red corpuscle-destroying food.

The sulphur interests have been able to say to the United States Government "hands off." Through their influence at Washington they were able to keep the Referee Board in a state of silence.

In the meantime Dr. J. C. Olsen, 1911, through his experiments showed that sulphurous acid destroys the kidneys. April 21, 1913, I urged the New York Department of Health, which has unlimited powers, to feed twenty orphan children daily with the same kind of sulphur-bleached dried fruit that twenty million other children in the United States are asked to eat. I suggested that if at the end of one year these twenty orphans should be found to be the victims of sulphurous acid poisoning, the Health Department would have justification for exercising its vast powers in the discouragement of the sulphite industry, and would doubtless be absolved of all charges of cruelty for having made the experiment.

The suggestion was looked upon as "inhuman." The same timid souls who would not feed twenty orphans systematically with bleached fruits, were willing to stand by idle while twenty millions of other children were exposed to its perils.

The Government itself as far back as November 22, 1907, in circular No. 37, declared: "Sulphurous acid in the food produces serious disturbances of the metabolic functions. It adds an immense burden to the kidneys, which cannot result in anything but injury. It impoverishes the blood in respect to the number of red and white corpuscles. It is in every sense prejudicial to health."

Yet sulphurous acid is in greater use to-day than ever.

The Food and Drug Laboratory of the University of California has openly criticised the government for its failure to act.

In volume 13, Nos. 8 and 9 of the Pennsylvania Department

of Agriculture Bulletin, October, 1915, Dr. M. E. Jaffa frankly asserts: "Up to date there has not been offered a process (except sun-drying) which can take the place of sulphuring, but grapes intended for human consumption should not be subjected to sulphur fumes as successful drying can be practised without the use of sulphur.

"In the case of the apricot and peach the oxidation of the sulphurous compounds to sulphuric is slow. Samples of Thompson seedless grapes have been tested with the result that while the content of sulphurous acid was below the limit permitted by the government, the sulphuric acid approximated ten times as much. The same is true as regards the desiccated bleached potato.

"The fruit grower tries to produce in his output a high degree of color. If the consumer did not demand intensely yellow fruit there would be no sale for it. Fruit is coloured by the grower so as to get a higher price for his goods. The grower is willing to put on the market a less highly colored product if the consumer will use it."

In the meantime the people living in and around Salano County, California, produced evidence to show that the sulphurous acid or sulphur dioxide liberated by smelting plants not only destroys the vegetation of the surrounding country, but injures the health of man and beast.

So poisonous is the bleaching agent used in the dried fruit industry that the commission reporting to the Bureau of Mines on its investigation made between June, 1913, and September, 1914, declared that in the proportion of 35 parts to 1,000,000 parts of air it is harmful to man, and that even 2 parts of the poisonous gas in 1,000,000 parts of air applied for four hours at one time, or for ten minutes a day, had such an injurious effect upon plant life that it actually decreased the yield of barley studied during the investigation.

The lower courts enjoined the smelting company from doing further injury, and the Supreme Court, to which the case was carried, confirmed the order, yet the sulphuring of food goes on.

§ 116—"CHOPS," WASTE AND JELLY

In the production of sulphured dried apples "apple waste" and "apple chops" are obtained as by-products.

The price of sulphured "chops" before the war ranged from 75 cents to $2 a bag of 100 pounds. They are used in the manufacture of cheap mince meat for bakers' use, and for the production of apple pie filler for the same purpose.

The price for "apple waste" before the war arranged from 60 cents to $1.25 a bag of 100 pounds. "Apple waste" is sold to jam and jelly manufacturers who boil it in a vat and then place the skins, cores and trimmings between filter cloths under a hydraulic press, to extract the juice.

This juice, with 60 per cent. glucose, 10 per cent. cane sugar, sufficient phosphoric acid to insure jellying quality, and coal tar color, with the aid of a chemical preservative, becomes a handsome mess. It is sold in 3-pound wooden pails through the grocery store, and in 30-pound wooden pails through the wholesale bakers' supply houses.

Let the housewife read the label. She will find there such phrases as "contains SO_2," "contains sulphur dioxide," "bleached with sulphur," etc.

These same phrases will be found on the molasses barrels and the wooden boxes in which dried fruit is shipped in wholesale quantities.

The grocer does not transfer the illuminating phrase to the paper bags in which he retails the bleached product. The baker does not transfer it to the pie or cake in which it appears. The confectioner does not label his candy accordingly.

When the government demands the labelling of the product, the information is intended for the trade, and the consumer does not get it. But a committee of housewives can invade grocery store and bakery for the purpose of seeing for themselves what kind of labels appear on barrels, boxes, pails and jars, the contents of which are so fraudulently beautiful, so chemically false.

The investigation ordered by Commissioner of Immigration Caminetti into the Ellis Island scandal in 1912 disclosed the fact that the pies forced upon the immigrants were composed as far as the filler was concerned, of sweetened, sulphured "apple chops." The pies were not labelled.

Anhydrous sodium sulphite is used by butchers all over the country. I have traced tons of it into interstate commerce, and have caused the arrest of scores of butchers who secretly employed it to give a fiery red colour to their stale meats, particularly to hamburger steak made from trimmings.

In the old days the juice of the sugar cane was clarified and evaporated in open kettles set directly over the fire. The wholesome and delicious by-product was called molasses.

To-day the stuff called molasses is clarified by the use of sulphurous acid, which is subsequently neutralised by the addition of an alkali. In the process the fine flavour and aroma of the cane are greatly destroyed.

In some factories the acid is introduced as the fumes of burning sulphur, in others in the form of acid sulphite of lime. Part of this sulphurous acid is eventually oxidised to sulphuric acid.

As a result of the system now employed molasses contains little of the sugar of the cane, but it does contain enormous quantities of mineral scale, sulphates and sulphites. The wholesome and benevolent mineral salts of sugar cane as it comes from the field range in quantity up to 1 per cent. The raw juice as expressed from the cane contains much less than 1 per cent. of these mineral salts, but so unnatural is the quantity of chemical neutralisers employed as refining agents that the finished molasses contains as much as 10 per cent. of useless mineral mud.

The food manufacturer takes the benevolent salts out of our food and then burdens it with enormous doses of minerals of a kind found in no food.

§ 117—MOLASSES AND CANE SYRUP

In the old days molasses was worthy of the name, but to-day, as we have seen, except for the inconsiderable quantities made

by a few farmers for home use, open kettle molasses has disappeared from the market.

Open kettle molasses is really not molasses at all; it is cane syrup.

In November, 1917, the Penick & Ford Co., Ltd., of New Orleans, La., experimented with such cane syrup and produced some 40,000 gallons of an unjuggled product, free from sulphurous acid or any of its salts.

In order to obtain a high price for inferior molasses, its manufacturer always bleaches it and the broker is forced to bleach it again, by the addition of more sulphites. "Blanket" they call it in the trade.

The Penick & Ford Co., Ltd., was amazed to discover that instead of having to sell the unbleached product at a discount it actually commanded a premium.

Early in 1918 at 17 Battery Place, the company's New York office, I tasted samples of this old-fashioned pure syrup, rejoicing over its flavour, its body and its colour. There it stood, an eloquent rebuke to the miserable commercial sophistries that have debauched the molasses industry these many years.

Although technically such cane syrup is not molasses, it tastes like molasses, smells like molasses, looks like molasses and differs from molasses only in that it is incomparably better. It is merely the boiled down juice of the cane, from which none of the crystallisable sugars have been extracted.

Commercial molasses represents the liquid that remains after the extraction of the first, second and third crop of sugar and the addition of the chemicals necessary to the extraction, including sulphites.

The stuff known as "first molasses" contains what is left of the cane syrup after a single crop of crystallisable sugar has been extracted.

As a rule first molasses is "too good" to be sold to the retail grocer for distribution to the consumer, hence it is put through a second extracting process, which withdraws a second crop of sugar crystals. The robbed product is then called "second molasses," which contains very much less sugar and very much more mineral mud than "first molasses."

With an eye to business the molasses manufacturer takes this

"second molasses" and again treats it to recover all the crystallisable sugar it will yield.

This product is known in the trade as "third molasses," the kind usually sold to confectioners and bakers.

The last product in the process of degeneration is called "black strap," the rank flavour of which must be diluted in the taffy factory and bake shops in order not to spoil the salable character of their finished luxuries.

"Black strap" is a thick, viscous, black mass containing 10 per cent. of inedible impurities consisting of gums, acids, amino compounds and other chemical residue, the conduct of which in the living bodies of children, when consumed regularly over a period of years, is utterly unknown to scientists.

Pure cane syrup or even "first molasses" free from sulphur dioxide would be cheap at any price, but the people cannot buy the former at all, and do not know where to seek the latter. Our grandmothers made us swallow sulphur and molasses in the spring. That sulphur was harmless. Sulphurous acid and sulphites are poisons.

We now know that the housewife who sacrifices food value for ornamentation indulges in perilous extravagance. When her wheat is devitalised and bleached with nitrites, the finished accomplishment is no longer flour.

The wondrously beautiful peacock is admired, but the flesh of the homely turkey is consumed.

Chalky white bread is demanded, but dusky devil cake does not shock.

The farmer never colours his wheat straw with coal tar green, but he asks that his manufactured jam be dyed a passionate red with gas house refuse. His butter, saturated with annatto or turmeric in a desperate effort to keep up appearances, has not the unassailable social standing of his white, creamy product.

The meat of the ox freshly slaughtered is brownish red, yet the butcher is encouraged to substitute a scarlet hue with sulphites, as if the poor beast had died of coal gas poisoning.

The breast muscles of birds that use their wings are dark. The white breast meat of the chicken is in a lingering state of degeneration, caused by the time-unhonoured atrophy of disuse.

Lazy people who sit in rocking chairs would make poor stew

for cannibals, although their flesh would become paler and paler, whiter and whiter the longer they rock before going to the caldron.

Coal is judged by its thermal heat units; food by its appearance.

We do not recoil from the homely brunette prune or the little darky raisin, but we yelp for the bleached blonds of the fruit world.

The eye is pleased with stained glass, gaudy beads, flashy trinkets, but the old-fashioned, sun-dried apple, rusty brown, and the old-fashioned sun-dried peach and apricot, lacking in skin beauty, possess food value and flavour incomparably superior to their chemically educated cousins.

All reforms have to begin somewhere. There is no time like now to begin this one.

§ 118—ROTS AND SPOTS

It never occurs to the average housewife that it is possible to use rotten eggs for baking purposes. She does not know that the putrefactive odours of the "spot" egg are volatilised in the heat of the oven, and driven off, leaving no trace perceptible to the sense of smell in the finished cake.

The baker is familiar with this phenomenon. I have caught many bakers in the act of using such eggs in the production of layer cake, sponge cake, and pound cake.

In one interstate conspiracy case tried in the Federal District Court, Trenton, N. J., before Justice Relstab, in which I was used as a witness by the Department of Justice, seven convicted men left the court room on their journey to the penitentiary. Their offence lay in the use of rotten eggs in the production of pound cake sold through the 5 and 10 cent stores of New York City, 40,000 pounds a day.

The quantity of rotten eggs available for baking purposes according to the Food Research Laboratory of the United States Department of Agriculture has a value of $50,000,000 annually. Armour & Company estimate the value at $90,000,000.

I have caught Armour & Company in the act of selling rotten

eggs to bakers at 3 cents a dozen, a crime against human decency for which this institution suffered conviction, but for which, unlike the other culprits convicted in Trenton, it was not sent to the penitentiary, paying a fine instead.

During the fall every case of 30 dozen eggs shipped to the large cities yields an average of 18 eggs known as "crax," "dirties," "leakers," "rots and spots."

The "spot" is the result of the action of putrefactive bacteria. The "light spot" of yesterday is the "heavy spot" of to-day; the "heavy spot" of to-day is the "rot" of to-morrow.

The egg candler can see the contents of any egg and determine its exact character without breaking the shell.

The light and medium "spots" after candling are broken into 30-pound cans and delivered in the liquid state to bakers, or frozen for future use.

"Spot" eggs, when poured through a sieve of fine mesh like ordinary window screen, leave a mass of putrid clots on the screen. Fresh eggs or sweet storage eggs pass freely through the screen.

The "spot" collectors who prepare them for bakery use receive on an average $3.75 per can of thirty pounds, or $12 per hundred pounds. Tanners can use such eggs but bakers pay a premium of $5 a hundred pounds over the tanner price.

The good bacteria which appear in buttermilk and sauerkraut are not to be confused with the bad bacteria that produce putrefaction in eggs. Putrefactive bacteria produce toxic substances. In the baking process these bacteria are destroyed, but their dead bodies and the poisons produced by them prior to their death remain in the cake.

Instinctively the human family abhors putridity of any kind. God has given man a nose, placing it on sentinel duty as near the mouth as possible. The nose detects evidence of putrefaction and warns the mouth against it. In the rotten egg cake the putrefaction is disguised, masked, camouflaged, and the nose, designed only for honest operations, fails to penetrate the fraud.

The public has no suspicion of the magnitude of this unholy business. In the metropolitan district alone within a period of twenty-six months, 208 rotten egg bakers have been prosecuted

and convicted. These prosecutions grew out of an intensive but wholly unconventional effort to check the abuse.

In rounding up the offenders I was endowed with authority by the mayor of Newark, the mayor of Jersey City, the health commissioner of Hoboken, the mayor of Mount Vernon and the health commissioner of New Rochelle. The police commissioner of Jersey City assigned eleven plain clothes men to help me and the New York Bureau of Municipal Research loaned me a score of assistants.

The disclosures of this little army of amateurs finally compelled the New York City Health Department and the Federal Government to act, with results that unfortunately are confined to one district of one state.

So few communities heed the rotten egg traffic that the men engaged in it actually defy detection.

In August, 1916, James Foust, Food Commissioner Pennsylvania Department of Agriculture, appealed to William H. Wilson, Director of Public Safety, and Francis S. Brown, Attorney General, for help in an effort to control the rotten egg business of his state. He complained of the secrecy practised by the rotten egg industry, its round-about methods, and the extraordinary precaution exercised to avoid suspicion.

"We find it practically impossible," he admitted, "to prevent the use of rotten eggs in establishments where food products are prepared or manufactured, such as bakeshops and the like."

This pathetic confession of inability to control the rotten egg industry in Pennsylvania ought to prove illuminating and suggestive to other food officials as well as to those communities that fail to provide adequate inspection.

In the absence of efficient inspection the housewives themselves can make it impossible for any bakery to operate that does not invite day and night inspection by the consumer.

The American housewife who orders her household supplies by telephone knows nothing of what is going on behind the scenes, and she never will know until she sallies forth in person to do her own marketing, exercising vigilance of a kind she has not dreamed of for many years.

§ 119—BAKERY WONDERS

The sum total of so-called "harmless" frauds to which the confectioner and baker have been educated by manufacturers and wholesale supply houses during the last twenty years, is now so great that it promises, if not checked, to leave nothing genuine in the industries which thrive upon them.

Compounds of foodless character have one by one taken the place of the old-fashioned materials of known virtue. Their presence is successfully concealed behind flavours, fillers and dye stuffs.

Prizes have been awarded by the manufacturers of patented compounds for the greatest number and variety of cakes produced by a baker employing the patented articles with the least possible quantity of flour, eggs, butter and milk. The purpose of these contests is obviously to demonstrate that the more the baker develops into a scientist the less real food his product need contain.

All the following bakers' and confectioners' products are now on sale in barrels, pails, kegs, bottles and boxes in every city in the United States:

Piefiline
Cakefiline
Frostine
Jellene
Marshmallene
Nuttene
Doughnuttene
Egolene
Aggola Powder
Aigo
Allenegg
Eggatine
Eggless
Eggola
No-Egg
Sa-Van-Egg
Wizzola
Yelco
Icene
Creamalene
Tartfilene
Butteral
Stearic Acid
Tallow
Packing Stock
Butyric Acid
Butyric Ether
Aluminum Sulphate
Chocolate Brown
Chocolate Black
Bleached Shellac
Avisol
Nonparif
Creamthick
Chinese Albumen
Frozen Spots
No-Be
Nitrite Flour
Bleached Potato Starch
Hydrogenated Oil
Carpenters Glue
Lamp Black
Alkalised Casein
Chops and Waste

Amyl Acetate	Velanearic Ether	Carmine
Amyl Buterate	Metal Salicilate	Vanillin
Velanear	Benzoic Acid	Coumarin
Acetic Ether	Sodium Benzoate	Naphthol Yellow S
Benzoic Ether	Sulphites	Orange-I
Formic Ether	Sulphurous Acid	Erythrosin
Nitrous Ether	Phosphoric Acid	Ponceau
Oenanthic Ether	Citric Acid	Amaranth

Egg-Yellow alone, for instance, is so powerful that a pinch covering the point of the small blade of a pocket knife will make a pound cake look like the incarnation of six eggs where no eggs are present.

The same quantity will colour sufficient starch and glucose to make a filler for a half dozen lemon custard pies without the use of a single egg.

Trade circles deny their commodities are employed to conceal inferiority. This defence never stands when a zealous official prosecutes. There are no prosecutions.

§ 120—SHORTENING WITH PETROLEUM

In January, 1918, I located a number of bakers in New York and Brooklyn using as a shortening agent, in place of lard or butter, a product knows as S. W. Mineral Jelly, manufactured by the Valvoline Oil Company. This product physically and chemically resembled white vaseline, deodorised, but is manufactured by a concern that has no relationship with the vaseline industry.

Mineral jelly has its legitimate uses, but it is without food value. It is made from mineral oil. The odor and flavor of petroleum are removed.

Gasoline is the first product of mineral oil refinement, then kerosene, then the lighter oils, then the heavy oils known as machine oil and cylinder oil, then the heavy petroleum or crude petroleum. By distillation this product is converted into white mineral jelly.

Possibly in all tragedy there is an element of humour. There are times when the ludicrous saves us from breaking under the weight of ignorance and barbarism which curses our children. Asking for bread we are told to eat cake. Thinking we are eating a product containing butter, lard, margarine or vegetable fats we really consume without our knowledge, approval or consent the residuum of the gasoline industry.

Bakers who employ these wonderful substances employ them in secret. They are not proud of them. They do not advertise them. Yet, these same bakers claim a share of what we foolishly in America call civilisation.

Civilisation is not wealth, power, luxury, self-esteem; not social eminence, not flourishing art, not the culture of the saloon, not the tread of mighty armies, not the wash of turbined fleets, not the accomplishments of industry.

Civilisation is not a veneer. It radiates from the heart through flesh that feels all flesh its own. Its fruits are active solicitude for the distressed, the poor, the weak ones of society; chivalrous devotion to woman, reverence of motherhood, love of children, sympathy with youth, indulgence for the old, abhorrence of special privilege, intolerance of all things narrow, secret, unfair, unclean; hunger for truth, thirst for justice, zeal for the commonwealth, passion for true liberty, inspired by democratic consciousness of inalienable rights, but bound by an equally imperious reminder of obligations and duties, loathing license, hating religious bigotry, scorning racial prejudice.

Civilisation means readiness to sacrifice self for the unborn, even as the millions who have died on the Western front have sacrificed themselves.

Civilisation flows from faith in God.

Can we in America attain this ideal? Perhaps, if we begin with our duty to the child.

Our boys who have fought and died have attained it. They did not die for self. For them the world's lights were extinguished, the world's voices hushed, the world's hand withdrawn.

If the giving of their lives was worth while it was not worth while for self, for self ended in the giving. They went to

slaughter not as cattle are driven from the pen to the killing bed, but with souls aflame.

They knew when that thing we call the "End" stalked up to them it had been misnamed. With blurred vision they recognised it as the Beginning. They knew they had souls. We know that, too.

How, then, shall we tolerate the soulless things through which, for the material profit of a few, our children crawl?

§ 121—LABELS AND STANDARDS

The people of America need food standards that will really standardise. The wholesale jobbing trade have adopted standards as a commercial check against fraud, but the consumer is not considered in their application.

In a few cities milk is no longer just milk; it is Grade A milk, Grade B milk, or Grade C milk. Cheese is no longer "full cream" cheese. It is now whole milk cheese or skim milk cheese.

With these two exceptions the housewife has no means of knowing the quality, character or purity of the product purchased by her, all the food laws notwithstanding. Even the cheese standard does not tell her whether the milk entering it was clean or dirty.

The honest cheese maker who screens his windows to keep out flies, and who pays a premium for clean milk, has no advantage over his indecent competitor. Indecency is encouraged because it can show a larger profit in competition with decency.

Bread surely should be standardised. Some bakers use lard, some use compound, others use ill-smelling fats, rescued from ignominy by heroic processes. The baker who uses pure shortening enjoys no commercial advantage over his neighbour using imitations.

A label adequately describing some of the loaves now on sale would inspire as much mirth as a Charlie Chaplin picture. The following cake label illustrates the point:

THIS CAKE
contains
Wheat Flour, Corn Syrup,
Uncertified Casein,
Chinese Egg Albumen, Egg-o-Sub,
Coal Tar Yellow, Alum, Sugar,
Coumarin, Vanillin, Tonca,
Water, Compound

If the cake contained a filler between the layers it would carry another label like this:

OUR FILLERS
contain
Glucose, Sugar, Coal Tar Red
Chop, Skin and Core Juice
Phosphoric Acid, Sodium Benzoate

Pies under a standard system would be curiously labelled.

In New York City mince meat is made for mince pies from horse meat. The meat of a young healthy horse would not be objectionable, but a young healthy horse is worth on the hoof at least $150 so that its dressed meat would cost at wholesale 60 cents a pound.

There is no such thing as horse meat; it is really nag meat. Broken down nags are purchasable at from ten to twenty-five dollars each. Their flesh should lead to this label:

MINCED NAG PIE
Crust Shortened with Petroleum

In Missouri the use of alum is unlawful in food products; elsewhere it is extensively honored.

In Wisconsin the adulteration of food is not a misdemeanour, and no penalty can be collected for a first offence.

In Minnesota no man has a constitutional right to keep secret the composition of substances sold by him as food.

In the trade coal tar dye is known as "egg color," "tomato red," "strawberry red," etc.

In bonbons the use of dye is ornamental. In orangeade, strawberry soda, raspberry soda, fruit icings, cakes, jams, jellies, pie fillers, tomato soup, macaroni, ice cream, smoked fish, cor-

dials, syrups, fruit juices, catsup and chili sauce it disguises inferiority and fraud.

Catsup made of sweet potatoes, pumpkins and other gourds has enjoyed a large sale by reason of "tomato red."

The grocers "best" pumpkin may be any one of the wholesale standards, "Fancy Golden," "Extra," "Choice," or "Good."

The grocer who sells "Good" as his best makes three times as much profit as the grocer who sells "Fancy Golden" as his best.

The housewife under present conditions does not know what the grocer knows, wherefore her ignorance can be juggled by trickery or protected by honesty, and she will never know.

John Philips Street, Connecticut Agricultural Experiment Station, reporting to the governor on twenty-three samples of canned pumpkin, found they ranged from forty-one cents to $1.28 a pound.

When the housewife asks the grocer to send her a can of peaches she usually says, "Send me a can of your best peaches." She does not know that there are "Extra Regulars," "Extras," "Extra Standards," "Standards," and "Pies." She knows nothing of the density of the syrup or whether the peaches are Melbas, Yellow Clings, Yellow Frees, Extra White Clings, Extra White Heaths, Extra Yellow Crawfords, Extra Standard Yellow Clings or Second Yellows. The labels are mum.

The grocer knows because he pays a different price for each. One standard costs the grocer a dollar a dozen less than another. Because the standards are not passed on to the housewife she knows nothing of the difference between the cheaper grades and the better grades, and so is easily misled through "bargains."

All canned peas are peas, but the grocer buys them from the wholesaler as "Double Extras," "Extra Sifted," "Sifted," "Standards," "Soaks."

The law standardises gold so that we have 24 carets, 18 carets, 14 carets, and 10 carets, but canned tomatoes are simply tomatoes, though they may be "Fancy Red," "Hand-picked," "Fancy Hand-picked," "Whole Solids," "Regular," "Extra Quality," "Choice," "Standard," or just "Good."

Canned corn may be "Fancy Maine," "Fancy Choice," "Maine Style," "Maryland," or just "Corn."

The whole canned food family, from salmon to plum pudding, runs through a wonderfully complex system of trade standards, but leaves the housewife always in the dark. Does she not want light?

§ 122—STANDARDS AND LABELS

Butter is wholly standardised as far as the wholesaler is concerned, and for each standard the retailer pays a different price, but usually the housewife has a choice of only two grades, butter and best butter.

The real standards are as follows:

Extra creamery	Renovated extras
Creamery firsts	Renovated firsts
Creamery under-firsts	Renovated lower grades
Creamery top-seconds	Ladles firsts
Creamery seconds	Ladles seconds
Creamery thirds	Ladles lower grades
State dairy, finest	Packing stock No. 1
State dairy, good to prime	Packing stock No. 2
State dairy, common to fair	Packing stock lower grades

This is why one grocer's worst butter may be another grocer's best and so on through a labyrinth of trickery for which the housewife in dismal ignorance pays the bill.

The most hopelessly unstandardised compound now to be seen in America is labelled "ice cream." Ice cream contains all the way from 2 per cent. fat to 14 per cent. This fat may consist of any fat, including cream.

The ice cream maker to-day uses a homogeniser with which he incorporates lard, cocoanut fat or any form of animal or vegetable compound with skim milk powder and water, or sweet skim milk.

All commercial ice cream contains a bodifier, usually in the form of glue. Imitation flavors and colors add to its mystery.

Honest ice cream made of Grade A whole milk, pasteurised, and so labelled, ought some day to establish the reputation of an honest man.

Why are there no standards to enlighten the housewife? In the first place until recently she had no vote. The political representatives of the food fakers did not consider her. They never will consider her until she serves notice that she is no longer ignorant of the subject of foods.

§ 123—CHEATING CATTLE

Millions of dollars are stolen annually from the farmer by manufacturers of dairy feed known as "balanced rations."

The adulteration of these feeding stuffs has grown constantly during the last twenty years. In the Fall of 1918 there were in New York State alone 1,760 separate and distinct brands of "mixed" feeds. The feed manufacturers had so monopolised the raw material, and had so dominated public officials, that the farmer found himself wholly unable to purchase straight feeds. He was obliged to buy them already compounded, notwithstanding the frequent exposure of the frauds they concealed.

The cost of producing milk, butter, cheese, eggs, poultry and beef have tremendously increased through the widespread distribution of these copyrighted "balanced rations," so many of which are actually worthless.

Despite this fact the officials, controlled by the manufacturers, have continued to ignore the shameful system although professing friendship for the farmer and consumer when seeking votes. They have known the truth; no defence of ignorance can excuse their failure to interfere with this nation-wide system of thievery.

In 1911 Dr. W. H. Jordan, director New York Agricultural Experiment Station, exposed the methods employed to conceal refuse by saturating it with molasses in the production of "balanced rations."

After describing the worthlessness of these adulterated feeds he informed the manufacturers that he was "utterly, out and out,

the enemy, here and everywhere, of the worthless stuff entering into compounded feeds."

In 1916 the Wicks Investigating Committee examined Dr. Jordan, obtaining from him further information concerning the fraudulent character of these adulterated feeds as revealed by long, continuous analyses in the New York State Laboratory, Geneva Experiment Station.

These exposures were recorded for the benefit of all state and federal officials in *Flour and Feed,* page 34, December, 1911, and in the *Wicks Committee Official Report,* page 784, 1916.

The official analyses showed that the feeds included ground corn cob, oat hulls, screenings, oat clippings, elevator sweepings, shredded straw, peanut hulls, sawdust, weed seeds, dirt and sand, to the extent of 50 per cent.

"The dairymen should avoid these prepared feeds," declared Dr. Jordan. "The molasses feeds have lent themselves to this sort of mixing because the molasses obscures the mixture. The oat refuse is worthless. It has no more feeding value than the straw refuse around the barn! Under the present law the manufacturer can put anything he wants to into these feeds, the price of which is actually higher than the market value of the ground grain which the farmer cannot now buy from the miller to mix for himself."

In 1912 the State of Indiana published an official analysis of "oat feeds" in contrast with oats. Oat groats, for instance, were found to contain fibre 1.97, ash 2.10 (normal and good), whereas oat straw contained 37 per cent. fibre and 5 per cent. ash; oat hulls 29.7 fibre and 6.7 ash; oat clippings 22.15 fibre and 15 per cent. ash (abnormal and bad).

The average of the mixed oat feeds examined disclosed the presence of 25.35 fibre and 6.56 ash, a total of 33 per cent. waste.

Dairy feed, containing this stuff, consists chiefly of wood and ash, mixed with black strap, the lowest by-product masquerading under the name of molasses. This black strap contains an additional 10 per cent. of ash, consisting of scale and the mineral residue of the chemical processes employed in the refining of

sugar. Thus the percentage of inert waste matter is pushed still higher.

Notwithstanding the agitation against the use of these indigestible and non-nutritious feeds, Dr. J. K. Haywood, U. S. Department of Agriculture, assured the feed manufacturers, 1913, that it was no longer necessary to go to court to settle differences. (See *Flour and Feed,* December, 1913, page 60.)

The same year G. A. Chapman, president of a feed manufacturing concern, who in 1918 became head of the Feed Division of the U. S. Food Administration, said: "We feed manufacturers do not want to sell for less than we can get for our stuff." (See *Flour and Feed,* December, 1913, page 31.) This statement fairly reflects the attitude of the mixed feed crowd toward the farmer.

The same year Dr. Haywood, U. S. Department of Agriculture, sitting with the feed manufacturers, moved the adoption of the phrase "corn gluten feed" to cover the stuff known as "corn starch bi-product with corn bran," urging that the word "refuse" be dropped in describing chaff, empty hulls, immature oats and dust. (See *Flour and Feed,* December, 1913, page 35.)

The worthlessness of ground corn cob and rice hulls had become so generally recognised by 1914 that June 1st of that year State Commissioner of Agriculture Page prohibited their mixture in compound feeds sold in Arkansas. The government did not follow. Why?

The same year Dr. James W. Kellogg, chief chemist Pennsylvania Department of Agriculture, reported on 600 samples of feed analysed by him. Fifty of the molasses feeds contained water to the extent of 20.24 per cent. He demonstrated that a single car of 20 tons of such feeds contains 3 tons of water. For this water the farmer in 1918 paid $60 a ton. He also paid the same price for the indigestible wood-fibre, scale, weeds, sand and refuse concealed in the only stuff he could buy.

By 1916 the New York State Feed Dealers' Association affiliated with the American Feed Manufacturers' Association, had become so bold in boycotting millers who dared sell unmixed feeding stuffs direct to the farmer that the attorney general, forced by the disclosures of the Wicks Investigating Committee, threatened prosecution.

To avoid prosecution the Feed Dealers' Association dissolved but immediately reformed under another name with the same members and the same officials.

Throughout all these years there have been no prosecutions. Apparently the farmer will always have to act for himself. He knows, or should know, that oat hulls, the outside shell which acts as a protecting overcoat for the grain within, whether it be oats, rice, wheat, barley or corn, are not in any manner similar to the sweet, tender, inner skin of the grain known as "bran."

Bran is essential to the health of dairy cattle as well as to the health of man. Hulls are essential only to the profit of the feed manufacturer.

§ 124—PASTEUR AND GOD

The handicaps of ignorance under which our grandfathers struggled, suffered and died, have been lifted from modern life through the application of many scientific discoveries, beginning with the achievement of that most brilliant, unselfish and idealistic of earth's benefactors, Louis Pasteur.

One does not have to go back fifty years to witness the typhoid epidemics that swept helpless communities to the grave. Yellow fever counted its victims by the thousands. Smallpox kept pace with this dread disease as a slaughterer of men.

Surgery knew nothing of antisepsis. Gangrene, blood poisoning and tetanus fought for the lives of those who were cut, mangled or bruised. Convulsions of infants with cholera-infantum destroyed hundreds of thousands. Child-bed fever, due to the ignorance of the medical world, was the nightmare of every physician.

It was not so long ago that piles of garbage, filth and decay were to be seen lying about in the camps, hamlets, villages, towns and cities of the nation. To-day every town has its health officer, every city its health department.

As much money is spent on public health in the United States as upon education. We control the sanitary conditions of floating baths, stationary pools, bathing beaches; we operate day nur-

series; we promote the progress of industrial hygiene, regulating public laundries, disinfecting passenger cars and omnibuses, requiring the removal of harmful gases from work rooms. We compel the owners of marsh lands and sunken lots to fill in or drain them, to prevent the breeding of mosquitoes.

We look after the sanitation and ventilation of theatres, and oblige physicians to report occupational diseases and injuries.

We prevent persons suffering from communicable diseases from working in their homes on articles intended for general consumption.

We regulate the free distribution of vaccines, antitoxins, serums and cultures.

We conduct contagious disease hospitals and tuberculosis clinics.

We inspect slaughterhouses and control the disposal of their offal.

We condemn the use of the common drinking cup and the common towel.

Until Louis Pasteur arrived our ignorance was abysmal. He taught us the relationship of micro-organisms to disease. He unfolded for us the mysteries of fermentation, decomposition and putrefaction. His discoveries now permeate every province of practical life.

Until he came the world knew nothing of the complications of elemental reaction; of the growth and diseases of plants, of the nutritional and pathological processes of animals, of the canning, drying, refrigerating and spoiling of food, of the treatment of water supplies, of the disposal of sewage, of the manufacture of vaccines and serums.

Prior to the birth of this God-sent messenger there was no guiding hand to lead the way out of the wilderness of disease. Wine soured; silk worms died; food rotted; children perished; anthrax killed cattle; men succumbed to rabies; until Pasteur, with an almost intuitive insight into the operations of nature, gave to the world his knowledge of micro-organisms.

Cow's milk could not then be made safe, as it is now made safe, thanks to Pasteur, in a few cities like New York, Chicago and Washington.

Klein, inspired by Pasteur, had not yet wrestled with the fact that diphtheria is communicated through milk.

Koch had not yet discovered tuberculin. The toxic substances which microbial life produce, extending to the poisoning of food through decomposition, were not even hinted at in dreams.

Prior to the war, 1914, the terrors of the European herdsmen had been put to sleep. All these forces, glorified still further by the introduction of Lister's aseptic and antiseptic surgery, have fought death with a conquering hand. Infectious diseases no longer scourge the world. Yet—it was only in the early "eighties" that they were traced to their origin; the organisms responsible for them isolated and studied in the light of prophylaxis.

Medicine in these few short years has grown out of an ignorant mysticism into a science, and public health has become a tangible reality. We even boast of a serum therapy for hog cholera and a vaccine for black leg.

Yet, notwithstanding the genius of Pasteur, who fought to preserve the life of man, many diseases are on the rapid increase.

In the past fifteen years typhoid has been reduced from 32.9 to 17.9, diphtheria from 29.6 to 18.8, but cancer has increased in the same time from 67.9 to 78.9; diabetes from 11.5 to 15.3; heart disease from 124.2 to 138.6; ulcer of the stomach from 2.9 to 4.0; Bright's disease from 87.4 to 92.5.

Why do these diseases increase? Alas, Pasteur, the idealist, who refused to profit commercially through his genius, who worked alone for God and man, who made no retort when the German scientists who afterwards established Pasteur Institutes in his honour, mocked him, flaunted him and sneered at him, is dead, and the scientific world to-day, profiting by all his achievements, stands in humiliation as unbridled disease laughingly gallops before their eyes in its ride to death.

As if looking into the future at those dreadful years, 1914-1918, Pasteur, in 1889, at the dedication of the Pasteur Institute, said: "Two opposing laws seem to be now in contest. The one, a law of blood and death, opening out each day new modes of destruction, forces nations to be always ready for battle. The

other, a law of peace, work and health, whose only aim is to deliver man from the calamities which beset him. The one seeks violent conquests, the other the relief of mankind. The one places a single life above all victories, the other sacrifices millions to the ambitions of a single individual. The law of which we are the instruments, strives even through the carnage to cure the wounds due to the law of war. Which of these two laws will prevail, God only knows. But of this we may be sure, that science, in obeying the law of humanity, will always labor to enlarge the frontiers of life."

This great Pasteur knew nothing of the forces of the soil that step upward to the higher life of vegetation and then on into that loftiest triumph of physical creation, the flesh of man, contributing their energies even beyond the flesh, which is but an instrument of the soul, but he did know the soul and its relation to its Maker.

"Happy the man," he wrote, "who bears with him a divinity, an ideal of beauty and obeys it; an ideal of art, an ideal of science, an ideal of country, an ideal of the virtues of the Gospel."

Above his tomb in the Institute Pasteur these words are graven.

It was Pasteur who wrote: "These are the living springs of great thoughts and great actions. Everything grows clear in the reflection from the Infinite. The more I know the more nearly is my faith that of the Breton peasant. If I could know all I would have the faith of a Breton peasant woman."

He could not understand the failure of scientists to recognise the manifestations of God that lie everywhere in the world around us. Because he thought that his work was like that of St. Vincent de Paul, who did so much for suffering children, he asked upon his death-bed that the life of the saint be read to him.

He, the believer in God, whom pagan science deifies as it has deified no other human genius, could see God in the laws of life.

His benefactions emerged from his spiritual vision.

To-day, in spite of his science, death continues to reap its harvest, because his successors have not only stopped where he left off, but in their pride have dismissed God from their equa-

tions, smiling when Pasteur is devoutly described as "a child of God."

If modern science would bow its head it would ask these questions: "With epidemics stamped out, why do we point with pride at the mortality records of the present day, when they disclose to us that in spite of all our wisdom, in spite of the army of public health workers who devote their lives to the control of disease, we permit the deaths of 400,000 children under ten years of age in the United States every year?

"Why are diabetes, Bright's disease, appendicitis, cancer of the stomach, heart disease, constantly increasing, when Pasteur, the author of our glories, placed in our hands the weapons that conquer death?

"Why do tuberculosis, malnutrition, anemia, nervous prostration and constipation still destroy hundreds of thousands annually?

"What would have been the vigor of our grandfathers had they possessed the scientific knowledge that Pasteur placed at our disposal?

"In their day man's food was not denatured.

"With all the influence now at work in his behalf, what would be the effect upon his health if it were not denatured to-day?

"In giving man his food, is it possible that God prescribed? Why, then, do we tolerate the distortion of His prescription?

"Shall we go on, baffled in our wisdom, or like that child of Faith, Pasteur, shall we journey back to God?"

§ 125—WHENCE CAME LIFE?

Evolutionists have pretended to trace the origin of man to the monkey by way of a "missing link," no trace of which, in spite of never-ending search, has yet been found outside the imagination of a solitary group of theorists.

From the monkey ever downward they journey into successively lower circles of life, passing through countless thousands of years until they reach the tadpole stage.

Still lower they descend into the dim realms of an unrecorded

history, reaching at last a single cell of living protoplasm, the Beginning of Life on Earth.

There they stop!

How did that protoplasm, the source of all life on this planet, as they contend, get here?

Pasteur saved millions of lives by demonstrating that "spontaneous generation" does not take place. What then, if it did not generate itself, can they say to explain the presence of protoplasm as the first link in their chain of life?

They are certain they have found the first link even though at the centre of their chain a missing link breaks the circle. Protoplasm! How came it to earth?

"Ah," they explain, "protoplasm originally immigrated from interplanetary space, after floating through starry regions perhaps for ages. Arriving at last, free and unincluded, upon the surface of the earth it found conditions accidentally favourable for its development and entered at once into that vast series of overlapping cycles whose glory is now manifested through millions of living creatures ranging in dignity from the protoplasmic cell in the belly of a jelly fish to a Woodrow Wilson or a Ferdinand Foch."

Loath to credit God with creation they choose rather to spin their tenuous filaments of hypothesis, until the thin web of speculation, hanging from supports of thinner nothingness, will no longer sustain the mote out of which are ravelled endless reams of biologic despair.

Rent after rent and tear after tear have ripped the reaches of their scientific gossamer until now its tattered remains are less visible than the skeletal fragments of the "missing link," of which not a single vertebra has yet been found.

In the year 1911, Truth tore another gap in the shreds and patches still fluttering in the winds of pagan unrest. B. S. Shattock and L. S. Dudgeon reported the results of experiments conducted to ascertain whether nonsporing bacteria, dried in a vacuum and kept there would survive those dried in air, or die more quickly.

They tested the action of sunlight, of heat and of cold, upon bacteria dried in an airless space in order to learn how far such solar and interplanetary conditions might be deadly to dried bac-

teria, if such bacteria could be supposed present in a free state beyond the limits of terrestrial atmosphere.

The Bacillus coli died on the fourth day both in vacuum and in air. The solar light and ultra-violet rays were fatal to these organisms in less than one hundred hours.

The Bacillus typhosus perished almost as rapidly.

The Staphylococcus pyogenes aureus survived from four to fifteen weeks, then died.

The Bacillus pyocyaneus was killed by exposure to bright sunlight in a vacuum in six hours. Nothing living can remain alive in the vacuum of sunlit space.

Science knows at last that dry bacteria, even if free to wander through the interplanetary vacuum, could not survive the solar rays. While journeying earthward (by any conceivable or inconceivable medium) through hundreds of millions of miles of vacuum separating planet from planet, they would be killed, if such a thing were possible, a hundred times over.

As Sir James Dewar's experiments have demonstrated that the ultra-violet rays will kill undried bacteria while frozen, at the temperature of liquid air, what becomes of the hypothesis that living protoplasm on the earth originally immigrated from the heavens? Dried or undried, in vacuum or in air, in heat or in cold, sunlight is fatal to the lowest forms of life and vacuum alone kills all its higher forms.

The earth was once a flaming sun in which no organic life of any form could exist. When it cooled sufficiently, passing from the gaseous to the solid state, conditions favourable to the support of life were developed.

Then life appeared. How did it appear?

The assumption that a wandering cell drifted from star to earth breaks down when it is seen that such cell could not have arrived in a living state, if it could have arrived at all.

But—though it could have found a sun-proof shield to protect it from the solar shafts and some other device for resisting the attack of the celestial vacuum how came it originally to the star from whence it migrated to earth? That star too, was once a flaming sun, an incandescent incinerator, a steriliser of life.

The answer is: "Spontaneous generation" has died a scientific death. Pasteur pasteurised the lie.

"Interplanetary migration" has died a scientific death, shattockised, dudgeonised and dewarised.

Even if protoplasmic life existed among the stars it had to be placed there, but under no conditions could it come away.

With drifting immigration and self-creation gone, to whom shall the scientist go to explain his protoplasmic life if not to God? All else has failed him. To be satisfied with failure is Death.

To whom shall he go for a formula to nourish his child? What God has given man suffices Life. What man makes of God's gift destroys life. Wherever he looks he sees the folly of seeking to explain creation as a protoplasmic accident. He sees a design, yet, with back to God, he smashes that design only to hear his children wail.

Oh, food of man, had you soul to match his soul, well might you ask, with all other things of God, to be let alone.

§ 126—PATRIOTISM

In the Seventh century the ducal states of Germany were disintegrated by the corrupt administration of the counts who, as officials in charge of the territorial districts, were not supervised by central authority. The complete disintegration of the states was brought about by a group of selfish interests that conspired to control all their economic interests and to exercise arbitrary powers over their politics.

This hidden power was, of course, invisible to the plain people until the crash ensued.

In America, during the canned beef scandal of 1898, and continuing progressively until the almost thwarted probe of the Federal Trade Commission, ordered by President Wilson, February 7th, 1917, complaints increasing in number and gravity were constantly heard in connection with the growth of a great invisible power in the United States. This power, like the German counts, sought to control economic interests and to exercise arbitrary powers over politics.

The poison that destroyed the ducal states was at work in the

new world. Much evidence had been adduced to indicate that this invisible power threatened to dominate visible government—to become greater than government.

The two questions that had to be answered were: "Is the safety of democracy threatened by the unmolested growth of this invisible power?" "Has it already destroyed the functions of many democratic institutions, and does it menace them all?"

The answer to these questions involves the very essence of patriotism.

The packers, who paid vast sums for the use of white space on which their declarations of patriotism were given to America at war, were involved in the system of invisible government that President Wilson wisely determined to examine.

The investigation of the Federal Trade Commission has done much to clarify the meaning of patriotism. Heretofore the public has known little, if anything, of the motives which inspired and controlled that investigation.

As one of the examiners of the Commission I believe my conferences with its members and staff have qualified me to describe the principles by which its activities were guided. Those principles were based on a conception of patriotism for which millions of American boys have been ready, without question, to lay down their lives.

Certainly the meaning of the word as it has been understood by the Federal Trade Commission is of interest to those boys. To the Commission as it exists in 1917 and 1918 patriotism means much more than love of country. It means love of right government extending even into foreign countries. The man who loves only one little spot of ground may be a poor patriot and a dangerous citizen, even though he boasts of loyalty and courage.

The father who loves only his own children, disregarding the children of his neighbour, may, in the narrowness of his interests, permit a condition to develop among his neighbor's children that will some day react upon his own to their destruction.

The Kaiser was looked upon in Germany as the very father of German patriotism, but the world now knows that his patriotism, narrow and selfish, was crammed with ruin for his own people. He cared nothing for the happiness or the rights of other nations. His selfishness in disregarding the interests of all his neighbours

not only plunged them into anguish and desolation, but it brought anguish and desolation home to his own.

The Kaiser was a bad patriot and a bad citizen because he neither loved right government in his own country, nor right government in any country.

This attitude toward society, because it clashes with all the laws of God and man, is described not only as uncivilised but as barbarous; yet the same principle execrated and reprobated in the person of the Kaiser applies to every individual and group of individuals in the world, when their interest in life is confined to selfish pursuits.

It was this brand of selfish patriotism that brought decay to civilisation in the valley of the Nile. The Egyptians could weld copper, an art lost to the modern world. The Egyptians who built their magnificent temples, their mausoleums, their pyramids, employing mechanical devices that have become extinct, were reaching out for universal democracy. Selfish patriotism undermined the Egyptian ideal, and to-day the land of the Pharaohs is dead, never to be born again.

Selfish patriotism brought decay to Greece and Rome. Greece flourished in glory, producing Plato, Aristotle and Socrates, three of the clearest thinkers the world has ever known. Our American museums are graced with fragments of the art of her sculptors. Even her songs have been preserved, but because selfish patriotism followed in the wake of her luxury ancient Athens is no more.

Socrates cried out against the decay that threatened Greece but the masters of her wealth would not listen to him. They gave him hemlock and sent him to his death.

Well has it been said that when a nation crucifies its thinkers, that moment that nation dies.

Rome, mistress of the world, stretched her boundaries as far north and west as Scotland. Her galleys sailed every sea, carrying her laws to all parts of the known world, returning with tribute, power and luxury to pour into her lap. Steeped at last in the dregs of narrow patriotism and brute selfishness, she awoke to find that decay had sapped her strength. When the barbarians came down from the North with their battering rams they smashed her gates, demolished her statues and pillaged her

libraries. Departing with her wealth, they left her lying prostrate on the sands of time.

Out of the wreck of the Roman Empire the Germanic states developed, and among them was born what is said to be one of the first democratic assemblies of Europe.

The new commandment, "Love one another," had not yet been applied by the patriots who posed as her rulers, statesmen and economic princes, but slowly the new philosophy of life, based on that commandment, crept into the hearts of the people, where it was dumbly cherished even though still unheeded by their rulers.

Eventually the new philosophy pushed its way westward as far as England. Men began to clamour for liberty, the very essence of democracy. Some of them became bold enough to advance the proposition that it was not true that a king could do no wrong. So clamorous became their cries that finally at Runnymede the Magna Charta was drawn up and signed. That document, although it contained the seeds of America's Declaration of Independence, still provided too much protection for selfishness and special privilege. There was cockle among its wheat, and King John held much the same contempt for democracy as that cherished by Napoleon and Wilhelm Hohenzollern.

At last, from England and Holland, stalwart men who loved freedom though they had not yet formulated its principles, came to America, where the foundations of democracy in time were established on soil consecrated by blood and sacrifice.

Wealth came, and with wealth, danger. The growth of selfish interests threatened the institutions that had cost so much.

Then Lincoln spoke, and after two millions of lives had been snuffed out in again uniting two peoples as one people under one flag and one law, the fools of their day killed the rail-splitter. With his death the last slave that will ever tread America's shores was free.

Again wealth threatened. Riches began to pour down from the mountains and up from the plains. Our rivers could not carry it so we built cars of steel and rolled them over rails from ocean to ocean. With riches came sick ideals.

Finally we received the first of many shocks. Little Belgium, protected by treaties, was crushed like an eggshell. The liber-

ties of the world were in the balance. America was again divided. Blinded by easy living and the gushets of her wealth, she was unable to see as a united nation the difference between right and expediency. Thus divided she could not interfere.

The bleeding little victim of selfishness incarnate stood the raiding monster off a little while, but in that moment of tragedy a better world was born. At last, chastened by the sufferings of others, the scales fell from our eyes, and our nation, united once more in a lofty ideal of patriotism, sent her boys forth to mingle their blood with the blood of a ravaged world, that true patriotism might again inflame the souls of men, not on any one little spot of ground, but all over the earth.

Through the deaths of millions, some of whom we once foolishly thought we held in contempt, characterising them always as "foreigners" when they sought liberty at our gates, even as our own fathers, who were also "foreigners," sought it before us, we have learned that in America there are not two or three sets of laws, but one law, and that under that one law there cannot flourish two or three kinds of citizens, but one kind of citizen.

The time had finally come for our government to say to any man who lives under the shadow of our flag: "You will remain here a true patriot, or you shall be sent away an outcast and an ex-patriot forever. The measure of your patriotism is not found in what you are able to gouge out of life, but what you put into it."

The Federal Trade Commission was the feeble instrument through which our government first probed the disease at home, hesitatingly, cautiously feeling its way until it was sure the ulcer had been reached.

The Commission embodied the doctrine that the disciples of special privilege in America are not patriots; that the masters of industry in America who seek to control legislation and to dominate the enforcement of laws to suit their own ends are not patriots; that eminent scientists and skilful lawyers who defend commercial expediency at the expense of justice and public welfare are not patriots; that it is necessary, in order to preserve democratic institutions, to place under proper and lawful control all those groups of narrow and selfish men whose activities tend to set up an invisible government, thus rendering good govern-

ment ineffective, or substituting bad government in its place.

Distracted by the horrors of overseas events, we have become almost indifferent to our home affairs, except in so far as they affect our winning of the war.

The Commission turned our attention to the Hun within our own gates, and as the evidence of its investigation discloses, the warning was sounded none too soon.

To its obvious and inevitable conclusions one might add that food manufacturers who seek to perpetuate pernicious methods of sophisticating the nation's dietary rather than revolutionise a system that can be defended only behind falsehood are not patriots; that the plain people who cling to follies that curse generations yet unborn are not patriots; that the ignorant and bigoted who foster religious prejudices and racial animosities are not patriots.

The sons of America who followed Pershing to Europe in 1918 went forth to uphold by their deaths the loftiest principle to which mankind has ever subscribed. They did not go forth to perpetuate narrowness, selfishness, greed or false patriotism at home.

They have shown America the perils of these selfish pursuits. They have opened America's eyes to the meaning of service to others. They have done much to prepare America to face the hard conditions that must be faced if these beloved hills and plains of ours are not to take their place beside Egypt, the old Greece, Ancient Rome and Modern Prussia.

TEN: IDEALLY BALANCED MENUS

TEN: IDEALLY BALANCED MENUS

§ 127—GETTING THE CHILD STARTED

The suggestions that follow are the result of constructive criticism urging their incorporation in the second and subsequent editions of this work. They are offered as ideal combinations for the food of children from the time they are weaned or taken from the bottle until their own grandchildren are born.

Adults may add to the combinations hinted at here anything they care to. There are no arbitrary exclusions from lobster up to plum pudding or from kippered herring down to chow-chow, provided only that the child is not permitted to share in such liberties.

In fact what is here proposed is but a skeleton hint ideally considered for children beyond the age of three. Prior to that time, dating from the weaning period, the same foods as they are individually found to agree with the weaned baby are wholly adequate to its needs. The combinations proposed are, obviously, generous. Half of any of them will suffice, even less.

Before weaning, a good doctor's advice should be solicited and heeded. Thereafter common sense, with due consideration to the personal idiosyncrasies of baby, should be the guide. Upon these projected outlines the adult may build as fancy inspires or whim commands, not ignoring the general law involved by permitting titillating goodies born in caprice to dominate the daily diet for any extended period or to be substituted for the simple substantials upon which health, strength, stamina, endurance and resistance to disease depend.

Breakfast, Monday

Half small grape fruit or sliced ripe apples, or ripe raspberries, or ripe blackberries, or ripe strawberries, or ripe canteloupe.

[Avoid green, immature, unripe fruit. At the beginning orange juice or baked apple should be the extremes of fruit indulgence.]

Natural brown rice and pasteurized milk.

Whole wheat bread or toast and pasteurized butter.

Breakfast, Tuesday

Scraped raw apple or baked apple or whole raw apple, skin and all, when the child can be trusted to use its teeth.

Whole wheat meal porridge and pasteurized milk.

Whole wheat bread or toast, pasteurized butter and honey.

Breakfast, Wednesday

Juice of whole ripe orange.

Old-fashioned cut oatmeal with pasteurized milk.

Whole wheat bread or toast and pasteurized butter, or whole wheat muffins, whole wheat cinnamon rings or other spiced breakfast bread containing all of the grain, be it wheat, corn, rye or oats.

Breakfast, Thursday

Stewed, unsulphured dates or stewed, unsulphured figs.

Poached egg on whole wheat toast.

Pasteurized milk.

Whole grain bread and pure maple syrup.

Breakfast, Friday

Stewed prunes.

Pasteurized milk.

Whole wheat pancakes or buckwheat cakes served with unsulphured, old-fashioned, open kettle molasses, made by hundreds of farmers in the South for southern consumption, but because of northern ignorance of its virtues rarely shipped beyond the Mason-Dixon line.

Breakfast, Saturday

Grape fruit, orange juice, apple or any other fruit.

Old-fashioned, undegerminated corn meal porridge and pasteurized milk.

Fruit muffins made of whole meal, date meats or raisins.

A hand-mill will give you freshly ground meal or cut breakfast foods if you can't buy them in the stores.

Breakfast, Sunday

Stewed figs or apple sauce.

Poached egg on whole wheat toast, or scrambled egg, or egg soufflé with a few strips of the crisp fat of broiled bacon. In the case of very young children up to four years of age, the lean meat, seared and hardened by the fire, should not be consumed.

Whole grain porridge with pasteurized milk.

Muffins, cinnamon rings, coffee cake or any of the other slightly spiced and sugared breakfast goodies that make the eyes of children sparkle and at the same time contribute to the sturdiness of their little lives.

§ 128—OBSERVATIONS ON BREAKFAST MENUS

These breakfast combinations are merely hints covering the importance of proteins, carbohydrates, fats, mineral salts and the so-called "vitamines."

It will be noted that the child will rarely be tempted to overeat when such combinations are in reach. The appetite not activated by cravings will be normal. To-day the child may eat bread in addition to the cereal, to-morrow may be content with less than a single slice or not satisfied with less than two. His needs will control the quantity consumed.

Any variations that normal taste demands or that will relieve monotony or any patented breakfast food made from the honest whole grain can be substituted as desired.

The fruit may consist solely of apples with splendid results. The necessary potassium and calcium salts are afforded by all juicy fruits. The whole grains and milk will supply all the protein, fats, carbohydrates and salts of iron, phosphorus, chlorine, sodium, lime, sulphur, silicon, magnesium and manganese necessary.

The unbolted germ of the whole grain and its outer layer will contribute solubles and cellulose without respect to any scientific table of grams, calories or vitamines.

If pasteurized dairy butter is not obtainable a vigorous effort should be made to supply it at least during three days of each week. During the other days one of the oleomargarine or nut butters, put out by reputable manufacturers, without the use of benzoate, may be substituted freely.

§ 129—DINNER MENUS

Dinner, Monday

Soup made of a combination of two, three, four or five fresh vegetables and greens, such as onions, parsley, carrots, spinach, parsnips, celery, celery tops, beet tops, the outer leaves of lettuce, cabbage and the stub ends of asparagus ordinarily discarded.

Steamed or baked potatoes served in the skin. When the skin is baked crisp the child may eat it with impunity. If soggy it is just as well not only to let the skin alone but also to banish the potato.

Poached egg or an egg cooked in its shell for ten minutes in water at 160 degrees Fahrenheit. Such an egg is "coddled" and emerges from the shell as soft as jelly.

Endives, lettuce, crisp celery or greens of any kind.

This combination may be substituted entirely for the soup but where means afford it will do no harm to have both.

For dessert three or four dates, one or two figs or a bunch of ripe grapes in season will top off the meal.

Dinner, Tuesday

Thick lentil soup.

Creamed carrots served in the water in which they are cooked, thickened with dry milk powder or whole meal.

Greens.

Whole wheat bread and pasteurized butter.

A little jelly or jam may be added.

Stewed, fresh rhubarb or any ripe fruit, cooked or raw.

Of course there are no objections to apple pie or cottage pudding, but for very young children the crust of the pie had better be removed. If you give them the "innards" you can eat the crust yourself and if you are interested in child psychology you will be amazed to note that the deal will provoke no uprising of Bolshevism in the household. The child will be "perfectly satisfied," offering no objection.

This phenomenon has been observed so frequently and with such persistence that it indicts the indulgence of parents who assume that any seeming discrimination against the child must be followed by an incipient disturbance of the peace.

Dinner, Wednesday

Onion soup made of the juice of stewed onions or any other vegetable broth which, according to American custom, is usually drained into the sink.

Creamed parsnips and peas served in their own sauce, to which dry milk powder again lends consistency, flavor and nutriment.

Tender corn on the cob and a potato may be included.

Whole wheat bread, pasteurized butter and granulated honey, which may be orange, alfalfa, sage, clover, buckwheat or any other kind the market affords. You can really get granulated honey, which is infinitely superior in flavor to liquefied honey, if you ask for it and continue to ask for it. All wholesale grocers in America can supply it and the retail grocer need only place his order to get it.

Any kind of fruit you care to serve.

Dinner, Thursday

Thick bean soup.

Stewed, fresh spinach served in its own sauce.

Any vegetable combination, including turnips, fresh beets, parsnips or potatoes.

Barley cakes, oat cakes, rice cakes or fruit muffins.
Apples, apple pudding or apple sauce.

Dinner, Friday

Soup made of greens with unpearled barley, natural brown rice, or both.

Dried peas, dried beans or dried lentils, soaked ten hours and cooked all night in a fireless cooker or in any other way that you care to adopt.

If you don't know the fireless cooker, try it.

Old-fashioned, sun-dried apples or sun-dried apricots if the fresh variety is not in season.

Whole wheat bread, pasteurized butter and jam.

Dinner, Saturday

Vegetable soup.
Natural brown rice with custard sauce.
Greens.
Sliced fresh pineapple, sliced fresh peaches, berries or canteloupe.
Whole wheat bread, pasteurized butter, with a half dozen ripe olives.

Dinner, Sunday

Chicken soup with boiled or roasted chicken.

After the age of five children may have in moderate quantities lamb or beef, but don't give them corned beef, ham or sausage.

Creamed onions, creamed cauliflower, Brussels sprouts, tender cabbage or string beans.

Greens.

Baked banana with cake containing real eggs and real milk or milk powder, or one of the good gelatin desserts.

§ 130—OBSERVATIONS ON DINNER MENUS

A thin film of fresh peanut butter on such days when eggs are not served makes a good addition to bread, but the peanut

butter must be fresh. When stale, peanut butter develops a decomposition substance known as acrolein, which is dangerous to children as well as to adults.

Nuts of any kind may be consumed by children when they have learned to masticate them thoroughly. Let "thoroughly" be emphasized.

The adult may grate Parmesan, Roman or Domestic whole milk cheese over anything he likes, but it is better to keep the cheese from the child. It must be remembered that cheese, like eggs, beans, peas, lentils, milk and meat, is a nitrogenous food. Americans consume too much nitrogen in the form of protein. Offending proteins are responsible for many forms of human distemper.

§ 131—THE EVENING LUNCH OR SUPPER

The child's evening lunch or supper should be light and requires no greater variety than milk and bread, to which anything in reason may be added, especially real whole wheat crackers.

Foods which the child should avoid entirely are the cheap, chemically flavored, dyed sweets that everywhere attract the juvenile penny, greasy gravy, fried foods of every kind, sulphur-bleached apricots, sulphur-bleached apples, sulphur-bleached peaches, sulphur-bleached pears, cheap condiments, vegetables that have lost their solubles, liver, kidney, hard boiled eggs unless mashed to a pulp, sulphur-bleached molasses, bakery cookies, bakery ginger bread and confectioner's taffy made from the low-grade, highly sulphured stuff that masquerades in the trade as "third and fourth crop molasses"; all tinned foods sold in tins that are not lacquered; all bakeshop or drug-store ice cream made from raw milk, homogenized fat (lard when it is cheap), carpenter's glue, ethereal flavors and coal tar colors; all factory cakes loaded with aluminum sulphate, ethereal flavors, fillers in the form of artificial jellies, etc. Coffee and tea are not permissible until growth has been attained.

§ 132—THE GROCERY OF THE FUTURE

Perhaps in the near future grocery stores, bakeshops, ice cream parlors and candy shops will take the public into their confidence by displaying signs something like those that follow. Such displays will be based, of course, on the assumption that each placard or bulletin represents a background of truth.

Bread

There is no legally standardized loaf of bread in America. Our whole wheat bread is made of certified whole wheat meal, shortened with fat that has not been chemically manipulated. If America had a legal standard the adulterator would not use the dusky color of the honest loaf as a mask to conceal inferiority.

The white bread maker would not then point to his immaculate loaf, free from the faintest tint of color. He would not contrast the "chastity" of that white loaf with the "defilement" of the dark one. It is not our fault that to-day the public looks with suspicion upon the masquerading "graham" loaf, losing faith in it and finally going back to the "clean" white loaf. The certified loaf of substantial bread with love and understanding kneaded into its heart, will be one of the glories of American manhood, womanhood and childhood when America finds time to give its bread attention. Such a loaf we sell.

Canned Foods

We recommend only such tinned foods as are packed in containers, the seams of which are soldered on the outside to prevent their contents from dissolving the poisonous flux frequently employed. Furthermore, we recommend only such tinned foods as are lacquered to prevent erosion by the action of enzymes and fruit or vegetable acids. Tin is not one of the benevolent minerals. It is not found in the human body except as introduced in the form of metallic salts dissolved from tin cans. Properly lacquered and properly seamed canned foods are good

but the dehydrated fruits and vegetables of the future will far surpass them in quality and economy.

Loose Milk

We don't sell it. When nobody sells it more babies will survive. One can dip a dirty hand up to the wrist or a dirty arm up to the elbow into a can of loose milk. One can add water not too scrupulously clean to loose milk. One can kill a baby to-day with yesterday's left-over from the bottom of the loose milk can. Loose milk is a barbarism which Twentieth Century civilization need not and should not tolerate.

Spices

Because dentists and other professional gentlemen need oil of cloves, oil of cinnamon and oil of mustard is no reason why we should sell exhausted spices. Our spices contain all the fixed and volatile oils with which Nature endowed them before they were ground.

Vanilla

Our vanilla extract contains no tonka, coumarin or synthetic vanillin. If you really want vanilla, the compound substitute is not what you want and we have no desire to fool you into accepting it.

Flavors

We don't sell synthetic strawberry, raspberry, peach, banana, pineapple, pistachio or cherry extracts made from formic ether, œnanthic ether, valerianate ether, ethyl ether, amyl ether, benzoic ether, butyric ether, esters and aldehydes. This is a grocery store, not a drug store.

Vinegar

We sell no spirit vinegar colored with caramel. Our cider vinegar originated in apples, not in acetic acid and a dye factory. Vinegar apples are cheap enough to justify popularity without resort to the indescribable. All vinegar is adulterated with water. So is ours.

Jam

We are members of the Society for the Prevention of Cruelty to Jams. Glucose, apple stock (skins and cores), apple juice (obtained from apple waste by boiling and the use of a hydraulic press), phosphoric or tartaric acid preserved with sodium benzoate and made brilliant with ribbon dye do not justify the bold print "berries" on the neck strip of the jar.

They more than justify the small print "compound" inconspicuously hidden along the margin of the label. If you will examine jam labels you will ask for membership in the Society.

Butter

Our butter is not a "top second" or an "under first." It is not processed or renovated. It is not made in a centralizing plant. It has not been whitewashed by a neutralizer. It is not included in the vast classification condemned by the U. S. Department of Agriculture as an "unsanitary product" manufactured from salvaged, inedible cream. Unfortunately the U. S. Government has done nothing to discourage the sale of such butter, except to talk about it in bulletins that are not read by the people. We not only talk about it but we refuse to sell it.

Oleo

We sell oleomargarine for what it is. The government, under the influence of vote-getters who pander to "the farmer," discriminates against it by insisting that the factories in which it is made shall be clean, thus distinguishing it from butter which the government permits to be made in factories officially described as dirty. Oleo is not supposed to contain the famous "fat soluble A" that has been trotted out by dirty-buttermakers to establish the alleged superiority of dirty butter over clean margarine.

We doubt that dirty butter, resurrected through the addition of soda ash, at which the U. S. Government winks, contains any "fat soluble A." The "fat soluble A" professors say nothing about soda ash or its influence over their trapeze-performing vitamines. This is a food store not a humor factory, or we'd stand here a long time and laugh with you over the butter farce.

Full Cream Cheese

We don't sell any. Nobody does. There is no such thing. Our cheese is whole milk cheese. It contains all the cream the cow gave but no more. We also sell skim milk cheese for just what it is, and it isn't bad at all.

Molasses

All so-called "New Orleans molasses" as now manufactured is bleached with sulphurous acid. The Supreme Court of Pennsylvania has condemned sulphurous acid as a poison. We have had to arrange for a special make of molasses. It is darker than the bleached kind because it is not doped. Its old-fashioned flavor is what you have been longing for since you moved from Louisiana in your childhood.

Dried Fruits

We sell prunes, raisins, currants and citron because they have not gone through the process known as "Panama hat bleach." We also sell sun-dried apples and apricots but none of the sulphured fruits that make us wonder why people who are satisfied with brunette raisins think they must have blond pears.

Hamburger Steak

We don't sell chopped meat reddened with anhydrous sodium sulphite. There is a law against such stuff in Pennsylvania and another one in this store.

Alum

The law allows alum in pickles, mince meat, relishes, condiments and baking powder. We don't. If you think alum is good for you try it on the cat. If the cat emerges from the test without injury we will gladly alter our policy.

Olive Oil

The only olive oil we sell is cold-pressed, virgin oil. If you would know something of the true degradation of the olive oil

industry refer to U. S. Department of Commerce Special Agents Series, Bulletin No. 75, which is a complete exposé of the deviltries practised at the expense of the American olive oil consumer by Italian, French and Spanish olive oil manufacturers. Ninety per cent. of the olive oil sold in America is a deodorized product that is passed on its way to you through such chemical solvents as carbon bisulphide, benzine, carbon tetrachloride and trichlorethylene, all of which are used in the resurrection of inedible oils for the American table.

Peanut Oil

There are many kinds of peanut oil but we sell only the virgin, cold-pressed oil which differs amazingly in fruitiness and quality from the hot-pressed peanut oil made from unsifted run-of-the-ground nuts.

When Americans begin to appreciate the fine flavor and distinctive quality of pure, cold-pressed peanut oil they will change their table habits.

"Pure" Means Nothing

All eggs, including storage eggs, are "pure" eggs. The crab-apple is just as "pure" as the greening. Shin bone trimmings are just as "pure" as porterhouse steak. Chemically treated corn oil, cottonseed oil, peanut oil and olive oil are just as "pure" as the oil that flows from the press. The word "pure" is overpuffed with pride. In the food world, through academic decisions rendered in the courts, it has come to mean nothing. When the most important word in the language is reduced to such a state of degeneracy you are obliged to rely more and more upon yourself. For this reason you can no longer afford to remain in ignorance where foods are concerned.

Economy

Small prunes contain twice as many pits and twice as many skins as large prunes. If you believe prune pits and skins are cheaper than prune meat, buy the small ones, but take our word for it you are fooling yourself.

Purely Vegetable

"Purely vegetable" does not mean harmless. Opium, strychnine, cocaine, nicotine, laudanum are purely vegetable.

Art

We have no art department. Coal tar dyes belong to the ribbon business, not the food business. Color schemes are all right on the label but not in the food.

Benzoate

If you want foods preserved with benzoate you can buy them down the street. We won't sell them because we have no M. D. sign outside and nobody behind the counter who is qualified to prescribe medicine in a grocery store.

One Dose

One dose of the food frauds against which we have taken a stand would hardly kill you. People don't die that way from food frauds. It is the evil history of food sophistication and the indecencies that food chemicals conceal that we object to.

Our Cakes

Our cakes contain eggs, not "egg color." If egg color was not intended to suggest the presence of eggs that are absent some other color would be employed and cakes would be lavender, purple, pink and green, not yellow.

Corn Meal

We sell corn meal containing all of the corn, including the good part always fed to hogs.

Brown Rice

All natural rice is brown. If the rice polisher who makes it white knows as much about rice and what it ought to look like as the Almighty who designed it to feed the human race, why

doesn't he produce the credentials that entitle him to so change its character that when he gets through with his job even chickens that eat the stuff cannot live longer than six weeks?

White Flour

God put vitalizing, tissue-sweetening mineral salts into the wheat; man takes them out and then wonders why there are so many false teeth. Use white flour if you must, but confine it to the trimmings. If bread is the staff of life, see to it that your children do not lean on a broken staff.

Candy

Our candy contains no coal tar dye, no synthetic chemical flavors, no soapstone, no radiator lacquer, no carpenter's glue, no paraffin, no weather-proofing shellac, no lamp black, no substitute for licorice or chocolate.

Hand Made

The body must be built from building material. It cannot get such material out of food unless it's in food. Hand-made or artificial concoctions do not substitute for Nature's offerings. Think this over when you are hungry.

Nuts

Walnuts, hickory nuts, peanuts, pecans, filberts, Brazil nuts, almonds were made to eat. That's what we have teeth for.

Milk Powder

We sell milk powder, freshly made from whole and skim milk, so clean and sweet at the beginning of the process that it required no neutralizer to correct its acidity. Stale milk cannot be successfully converted into milk powder without chemical manipulation. Honest milk powder is destined to come into daily use in the American home. It just naturally flows into gravies, cream sauces, mashed potatoes, custards, the ice cream freezer and the chocolate pot. Like all other human foods, it is abused. The brands we sell have a history.

Honey

People have the foolish notion that honey as sold in bottles should be liquid or it isn't "pure." Therefore they look with suspicion upon any honey that is not liquid. The only place pure honey, unprocessed, remains liquid is in the comb. When withdrawn from the comb it granulates, assuming the consistency of candy creams. Pandering to the false notions of the people, the honey distributor subjects his freshly extracted honey as it is taken from the comb to heat for a half hour. After this process honey will not granulate.

During the liquefying process its whole character is changed and the highly volatile, aromatic, flowery flavor of the nectar is dissipated and lost forever. The public has no conception of the vast difference between granulated honey as it ought to be and liquid honey as it is. One can liquefy one's own granulated honey at home if one wants to. There is certainly no justification or necessity for degrading it by liquefaction in a factory.

Grayfish

Canned grayfish represent a Government innovation. Grayfish have been misbranded by the U. S. Department of Commerce in order to take the curse off the fish. Under their real name—dogfish—a mad species of shark, people would not buy them or eat them. One might as well try to sell canned buzzard, canned crow, canned vulture, canned hyena, canned wolf, canned wild cat under their proper names. Realizing the necessity of camouflage, the Government itself actually broke down the spirit of the Food and Drugs Act, as it applies to misbranding, by giving the canners of dogfish a legal right to offer their salvaged sea offal under a misleading label. Had a plain citizen done this he could have been prosecuted, but when the Government itself lifts the bars against misbranding, a precedent is established for the emulation of plain citizens and no man may now foresee the future of misbranding.

Fortunately grayfish are not a success and the people will not eat them under any name, even though they are sold in carload lots to the unsuspecting grocer.

Table Syrups

The old word "glucose" has lost its dignity and with it its popularity. Another camouflaged phrase has had to be invented to neutralize the public's misgivings concerning this artificial syrup. "Corn syrup" is the new name given to the old product, but "corn syrup" is not corn syrup; it is cornstarch syrup. Corn syrup is not made from the whole corn and does not contain the food virtues of whole corn. It is merely hydrolized starch, chemically converted from granular carbohydrate form to liquid carbohydrate form. It has no sweetening power of itself and consequently must be mixed with other sweeteners of doubtful superiority in order to make it salable.

Corn Flakes

Little of the corn remains in the corn flake except the starch. Corn flakes are not an ideal food for children. Try to bring up a pen of pigs or a coop of newly hatched chickens on corn flakes if you would appreciate the difference between corn flakes and corn. On a diet of corn flakes they will die; on a diet of corn they will thrive.

Farina

Farina is simply a form of white patent flour in granules. When these granules are reduced or pulverized they become flour. In bulk you can buy farina at retail in small quantities at about $15 a barrel. Under fancy names in packages you can buy the same thing at $28 a barrel. In either case when you buy it, you will buy none of the tissue-sweetening virtues of the wheat.

Macaroni

Macaroni and spaghetti, although composed of white patent flour, and very frequently a little yellow coal-tar dye to suggest the presence of eggs, giving them the rich golden color commonly associated with artificially decorated noodles, are not to be looked upon with the same misgivings as those with which we regard white bread. Bread is the staff of life and is used at every meal. Macaroni and spaghetti are used occasionally. Dressed with rich

tomato sauce and grated cheese they have much to recommend them when honestly made and honestly sold.

We condemn no food luxuries brought into the household to relieve monotony. If we had honest bread three times a day we might eat almost anything with impunity; hence our apparent discrimination in favor of macaroni and spaghetti.

"Offsetting" Foods

"Eggs, fresh vegetables, fresh fruits and greens," declare the champions of the present system of food debasement, "afford plenty of 'offsetting' foods which more than make up for the deficiencies recorded against refined or impoverished foods."

We can indeed supply the deficiency found in 5 cents' worth (one pound) of patent white flour by purchasing $1 worth of "offsetting" lettuce, 80 cents' worth of "offsetting" oranges, 70 cents' worth of "offsetting" eggs or 36 cents' worth of "offsetting" milk. High prices, of course, have nothing to do with keeping these "offsetting" foods out of the hands of the plain people.

It is consoling to know that we can always supply the indispensable tissue-sweetening salts that ought to be present in 5 cents' worth of unrefined cereals if we will only go out and spend $1 in some other "offsetting" direction, but there aren't sufficient dollars in the world to supply a sufficient number of expensive "offsetting" foods to take the place of the deliberately squandered tissue-sweeteners, sifted and bolted out of the mainstay of man's life—bread. The cheapest "offsetting" food in the world is withdrawn from the cheapest food in the world—bread. Robbed man and his robbed children are then calmly informed that they can restore the loss by investing twenty times as much money in "offsetting" food as they are able to spend. This is domestic economy with a vengeance but it is actually taught in many universities.

Our $2,000,000,000 wheat crop of 1919, robbed of its precious life-sustaining, tissue-sweetening, vitalizing salts, can be "set right" by spending $40,000,000,000 (more than it cost extravagant America to get in and out of the war) in order, forsooth, to repair with "offsetting" foods the "trivial and inconse-

quential" damage sustained by our refined bread and breakfast foods.

Soda Crackers

Under various patented names soda crackers, never referred to as a product of a "bread trust," but sold in fancy packages under fancy names at 9 cents each, retail, containing 4¾ ounces, cost you $59.45 a barrel. Loose soda crackers selling at retail at 20 cents a pound cost you $39.20 a barrel. Perhaps the difference of $20 a barrel really represents the actual value of the sanitation included in the fancy package, but the difference between a barrel of flour as purchased by bakers at $10.50 wholesale and the fancy product at $59.45 or $39.20 a barrel, constitutes in our opinion what the world really means when it talks of profiteering but thinks it has something else in mind. If we took the savings now pocketed by profiteers and applied them to child welfare work, America would be great among the nations.